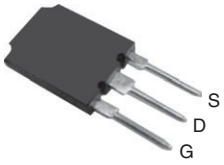
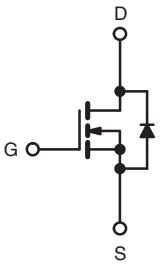
Power MOSFET

Super-247





N-Channel MOSFET

FEATURES

- Superfast body diode eliminates the need for external diodes in ZVS applications
- Lower gate charge results in simple drive requirements
- Enhanced dV/dt capabilities offer improved ruggedness
- Higher gate voltage threshold offers improved noise immunity
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

Pb-free

RoHS COMPLIANT

HALOGEN FREE

APPLICATIONS

- Zero voltage switching SMPS
- Telecom and server power supplies
- Uniterruptible power supplies
- Motor control applications

PRODUCT SUMMARY		
V_{DS} (V)	600	
$R_{DS(on)}$ (Ω)	V_{GS} = 10 V	0.12
Q_g (Max.) (nC)	320	
Q_{gs} (nC)	85	
Q_{gd} (nC)	160	
Configuration	Single	

ORDERING INFORMATION	
Package	Super-247
Lead (Pb)-free and halogen-free	SiHFPS38N60L-GE3

ABSOLUTE MAXIMUM RATINGS (T_C = 25 °C, unless otherwise noted)

PARAMETER			SYMBOL	LIMIT	UNIT
Drain-source voltage			V_{DS}	600	V
Gate-source voltage			V_{GS}	± 30	
Continuous drain current	V_{GS} at 10 V	T_C = 25 °C	I_D	38	A
		T_C = 100 °C		24	
Pulsed drain current [a]			I_{DM}	150	
Linear derating factor				4.3	W/°C
Single pulse avalanche energy [b]			E_{AS}	680	mJ
Repetitive avalanche current [a]			I_{AR}	38	A
Repetitive avalanche energy [a]			E_{AR}	54	mJ
Maximum power dissipation	T_C = 25 °C		P_D	540	W
Peak diode recovery dV/dt [c]			dV/dt	19	V/ns
Operating junction and storage temperature range			T_J, T_{stg}	- 55 to + 150	°C
Soldering recommendations (peak temperature)	for 10 s			300 [d]	
Mounting torque	6-32 or M3 screw			10	lbf · in
				1.1	N · m

Notes

a. Repetitive rating; pulse width limited by maximum junction temperature (see fig. 12)
b. Starting T_J = 25 °C, L = 0.91 mH, R_g = 25 Ω, I_{AS} = 38 A, dV/dt = 13 V/ns (see fig. 14a)
c. I_{SD} ≤ 38 A, dI/dt ≤ 630 A/μs, V_{DD} ≤ V_{DS}, T_J ≤ 150 °C
d. 1.6 mm from case

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THERMAL RESISTANCE RATINGS

PARAMETER	SYMBOL	TYP.	MAX.	UNIT
Maximum junction-to-ambient	R_{thJA}	-	40	°C/W
Case-to-sink, flat, greased surface	R_{thCS}	0.24	-	
Maximum junction-to-case (drain)	R_{thJC}	-	0.22	

SPECIFICATIONS (T_J = 25 °C, unless otherwise noted)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Static						
Drain-source breakdown voltage	V_{DS}	V_{GS} = 0 V, I_D = 250 µA	600	-	-	V
V_{DS} temperature coefficient	$\Delta V_{DS}/T_J$	Reference to 25 °C, I_D = 1 mA	-	410	-	mV/°C
Gate-source threshold voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250 µA	3.0	-	5.0	V
Gate-source leakage	I_{GSS}	V_{GS} = ± 30 V	-	-	± 100	nA
Zero gate voltage drain current	I_{DSS}	V_{DS} = 600 V, V_{GS} = 0 V	-	-	50	µA
		V_{DS} = 480 V, V_{GS} = 0 V, T_J = 125 °C	-	-	2.0	mA
Drain-source on-state resistance	$R_{DS(on)}$	V_{GS} = 10 V; I_D = 23 A [b]	-	0.12	0.15	Ω
Forward transconductance	g_{fs}	V_{DS} = 50 V, I_D = 23 A [b]	20	-	-	S
Dynamic						
Input capacitance	C_{iss}	V_{GS} = 0 V, V_{DS} = 25 V, f = 1.0 MHz, see fig. 5	-	7990	-	pF
Output capacitance	C_{oss}		-	740	-	
Reverse transfer capacitance	C_{rss}		-	72	-	
Effective output capacitance	C_{oss} eff.	V_{GS} = 0 V, V_{DS} = 0 V to 480 V [c]	-	350	-	
Effective output capacitance (energy related)	C_{oss} eff. (ER)		-	260	-	
Total gate charge	Q_g	V_{GS} = 10 V; I_D = 38 A, V_{DS} = 480 V see fig. 7 and 15 [b]	-	-	320	nC
Gate-source charge	Q_{gs}		-	-	85	
Gate-drain charge	Q_{gd}		-	-	160	
Gate resistance	R_G	f = 1 MHz, open drain	-	1.2	-	Ω
Turn-on delay time	$t_{d(on)}$	V_{DD} = 300 V, I_D = 38 A, R_G = 4.3 Ω, V_{GS} = 10 V, see fig. 11a and 11b [b]	-	44	-	ns
Rise time	t_r		-	130	-	
Turn-off delay time	$t_{d(off)}$		-	92	-	
Fall time	t_f		-	69	-	
Drain-source body diode characteristics						
Continuous source-drain diode current	I_S	MOSFET symbol showing the integral reverse p - n junction diode 	-	-	38	A
Pulsed diode forward current [a]	I_{SM}		-	-	150	
Body diode voltage	V_{SD}	T_J = 25 °C, I_S = 38 A, V_{GS} = 0 V [b]	-	-	1.5	V
Body diode reverse recovery time	t_{rr}	T_J = 25 °C, I_F = 38 A	-	170	250	ns
		T_J = 125 °C, dI/dt = 100 A/µs [b]	-	420	630	
Body diode reverse recovery charge	Q_{rr}	T_J = 25 °C, I_F = 38 A, V_{GS} = 0 V [b]	-	830	1240	nC
		T_J = 125 °C, dI/dt = 100 A/µs [b]	-	2600	3900	
Reverse recovery time	I_{RRM}	T_J = 25 °C	-	9.1	14	A
Forward turn-On time	t_{on}	Intrinsic turn-on time is negligible (turn-on is dominated by L_S and L_D)				

Notes

a. Repetitive rating; pulse width limited by maximum junction temperature (see fig. 12)

b. Pulse width ≤ 300 µs; duty cycle ≤ 2 %

c. C_{oss} eff. is a fixed capacitance that gives the same charging time as C_{oss} while V_{DS} is rising form 0 % to 80 % V_{DS}
C_{oss} eff. (ER) is a fixed capacitance that stores the same energy as C_{oss} while V_{DS} is rising from 0 % to 80 % V_{DS}

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TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)

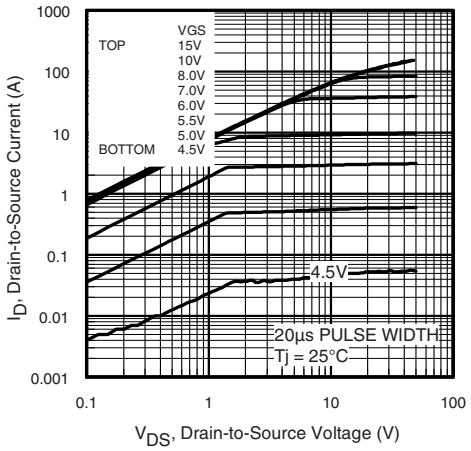


Fig. 1 - Typical Output Characteristics

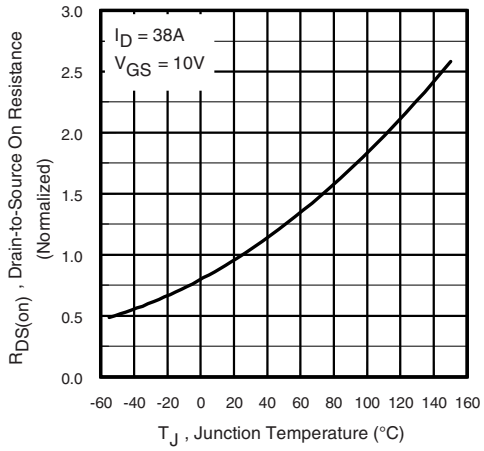


Fig. 4 - Normalized On-Resistance vs. Temperature

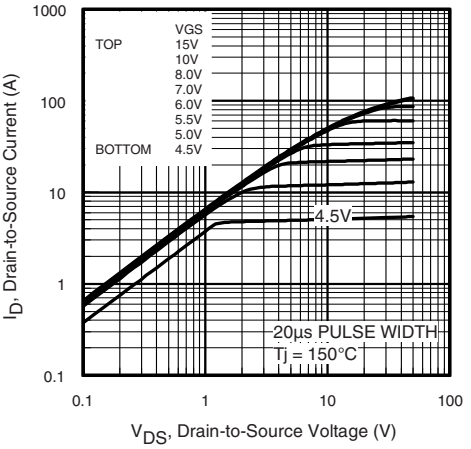


Fig. 2 - Typical Output Characteristics

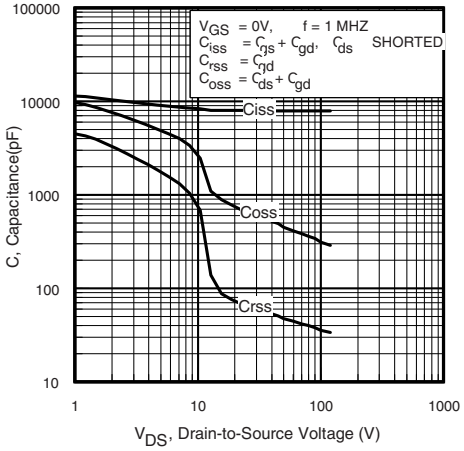


Fig. 5 - Typical Capacitance vs. Drain-to-Source Voltage

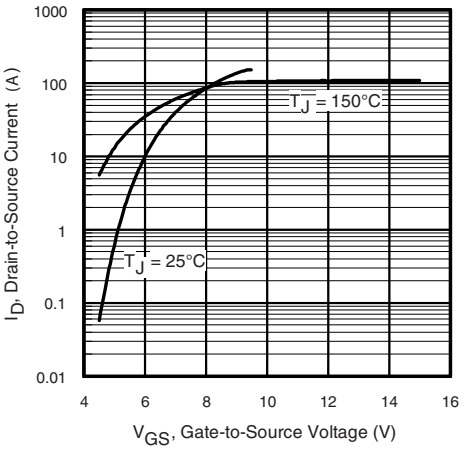


Fig. 3 - Typical Transfer Characteristics

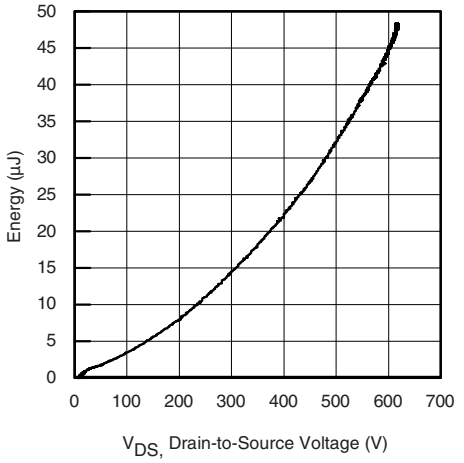


Fig. 1 - Typical Output Capacitance Stored Energy vs. V_{DS}

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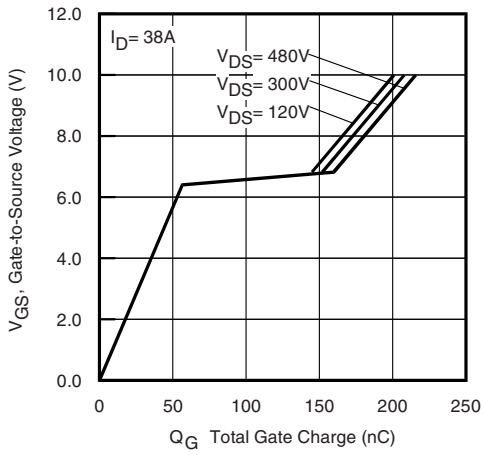


Fig. 2 - Typical Gate Charge vs. Gate-to-Source Voltage

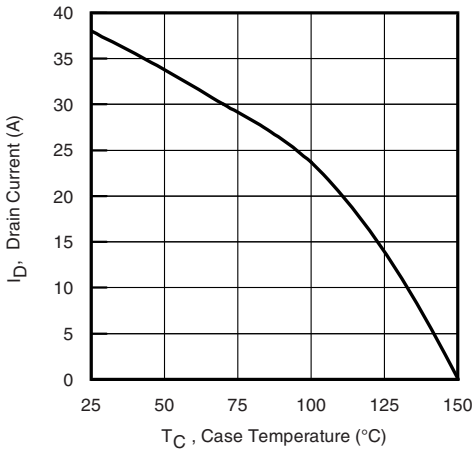


Fig. 10 - Maximum Drain Current vs. Case Temperature

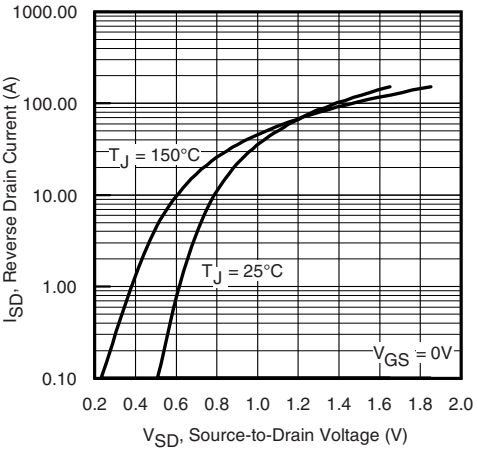


Fig. 8 - Typical Source-Drain Diode Forward Voltage

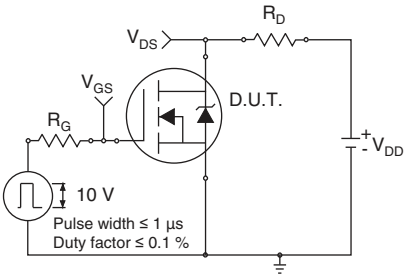


Fig. 11a - Switching Time Test Circuit

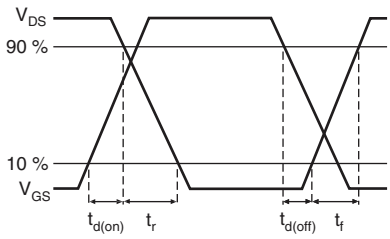


Fig. 11b - Switching Time Waveforms

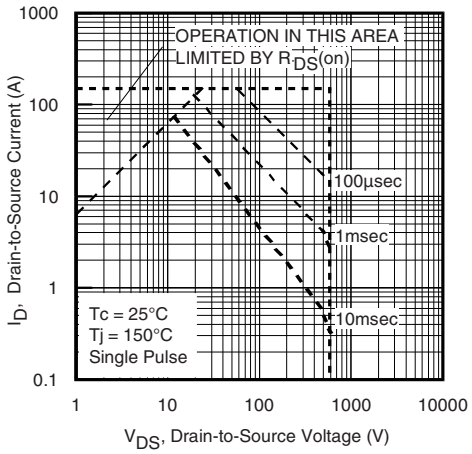


Fig. 9 - Maximum Safe Operating Area

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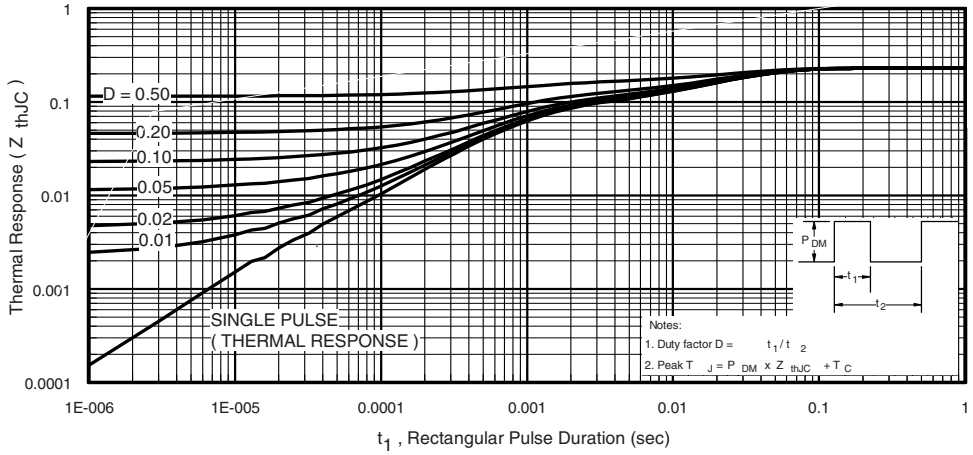


Fig. 10 - Maximum Effective Transient Thermal Impedance, Junction-to-Case

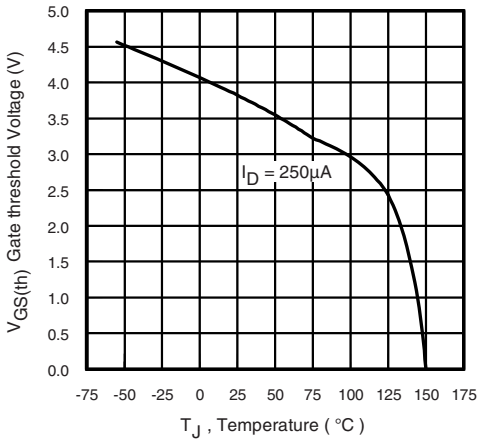


Fig. 13 - Threshold Voltage vs. Temperature

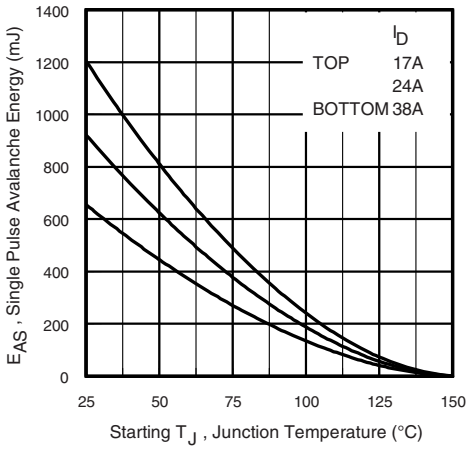


Fig. 14a - Maximum Avalanche Energy vs. Drain Current

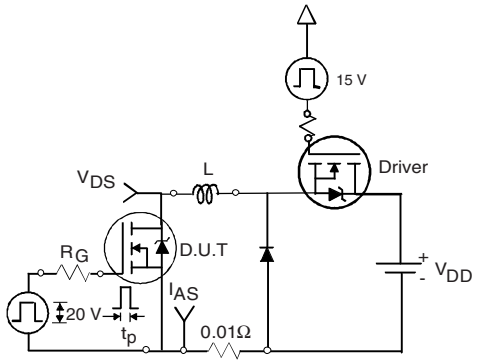


Fig. 14b - Unclamped Inductive Test Circuit

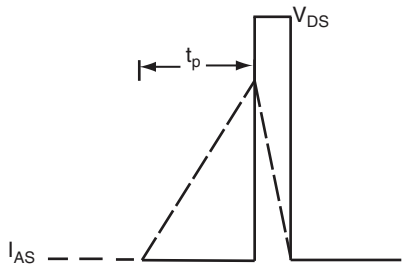


Fig. 14c - Unclamped Inductive Waveforms

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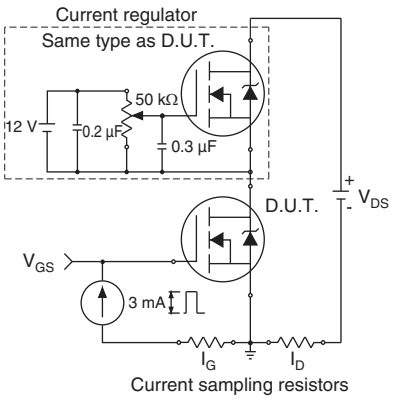


Fig. 15a - Basic Gate Charge Waveform

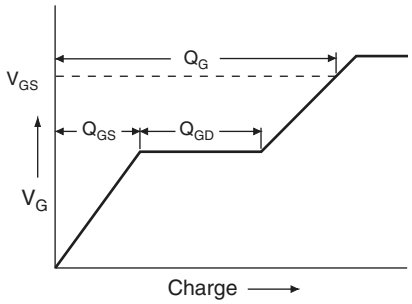
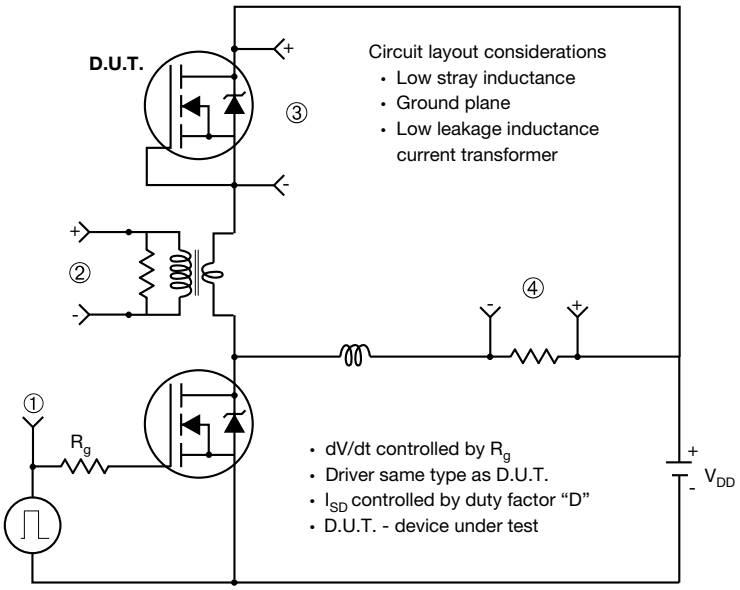
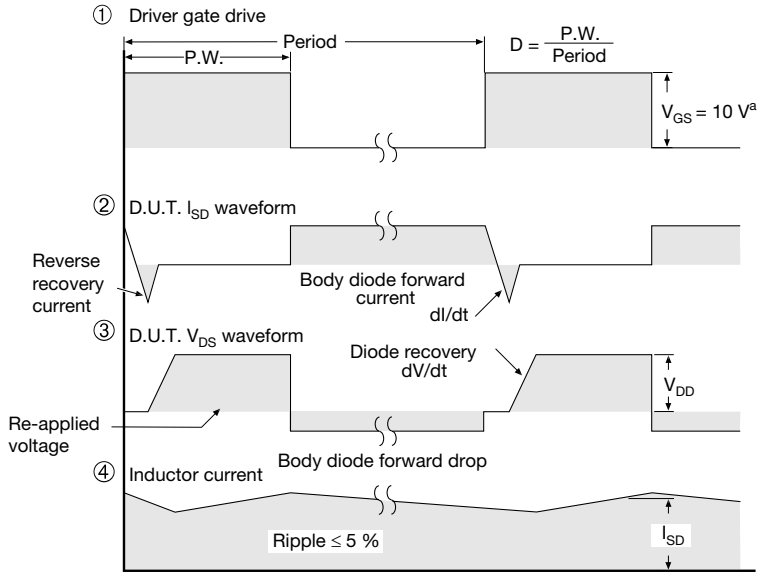


Fig. 15b - Gate Charge Test Circuit

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Peak Diode Recovery dV/dt Test Circuit





Note

a. V_{GS} = 5 V for logic level devices

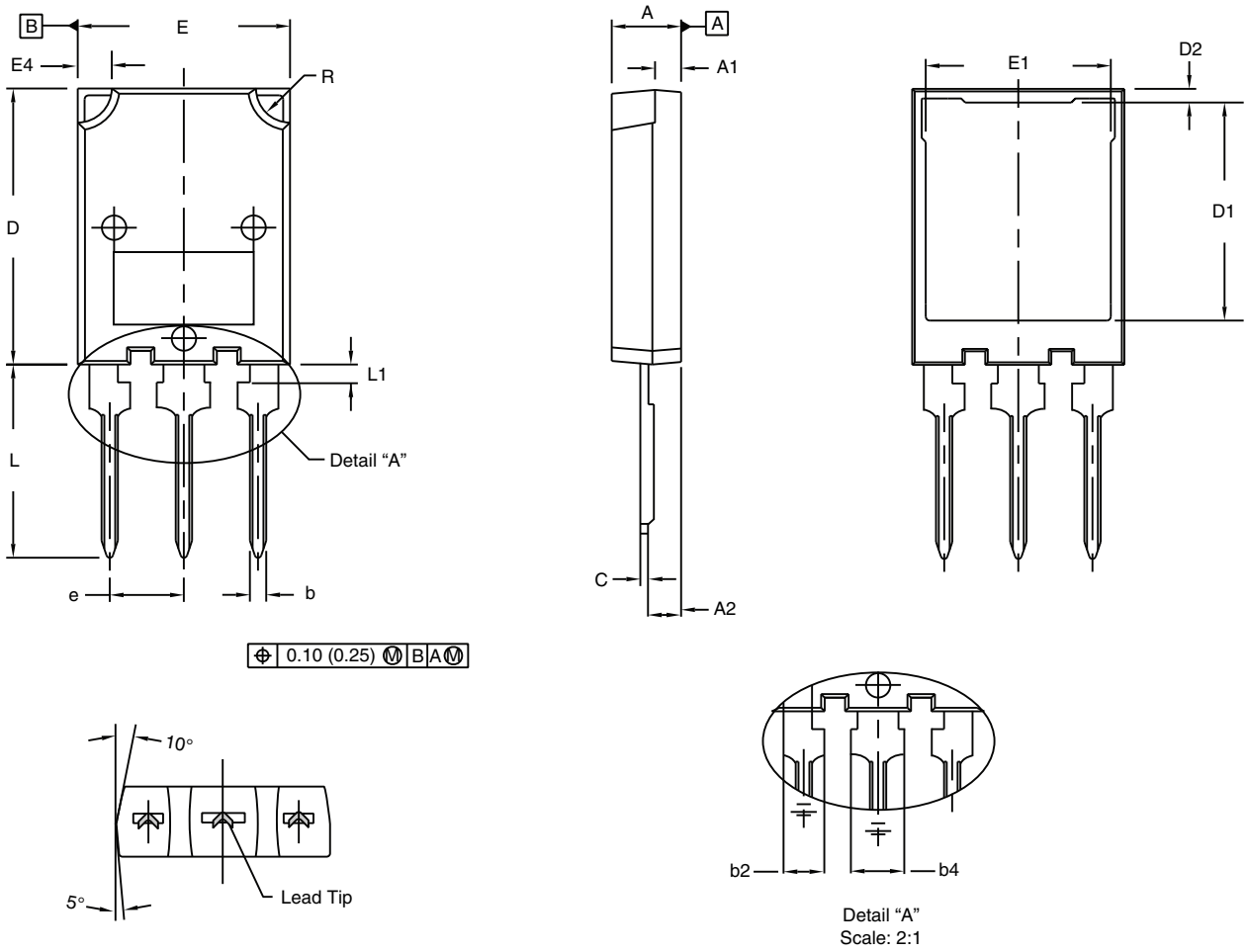
Fig. 16 - For N-Channel

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TO-274AA (High Voltage)

VERSION 1: FACILITY CODE = Y



	MILLIMETERS		INCHES	
DIM.	MIN.	MAX.	MIN.	MAX.
A	4.70	5.30	0.185	0.209
A1	1.50	2.50	0.059	0.098
A2	2.25	2.65	0.089	0.104
b	1.30	1.60	0.051	0.063
b2	1.80	2.20	0.071	0.087
b4	3.00	3.25	0.118	0.128
c (1)	0.38	0.89	0.015	0.035
D	19.80	20.80	0.780	0.819

	MILLIMETERS		INCHES	
DIM.	MIN.	MAX.	MIN.	MAX.
D1	15.50	16.10	0.610	0.634
D2	0.70	1.30	0.028	0.051
E	15.10	16.10	0.594	0.634
E1	13.30	13.90	0.524	0.547
e	5.45 BSC		0.215 BSC	
L	13.70	14.70	0.539	0.579
L1	1.00	1.60	0.039	0.063
R	2.00	3.00	0.079	0.118

Notes

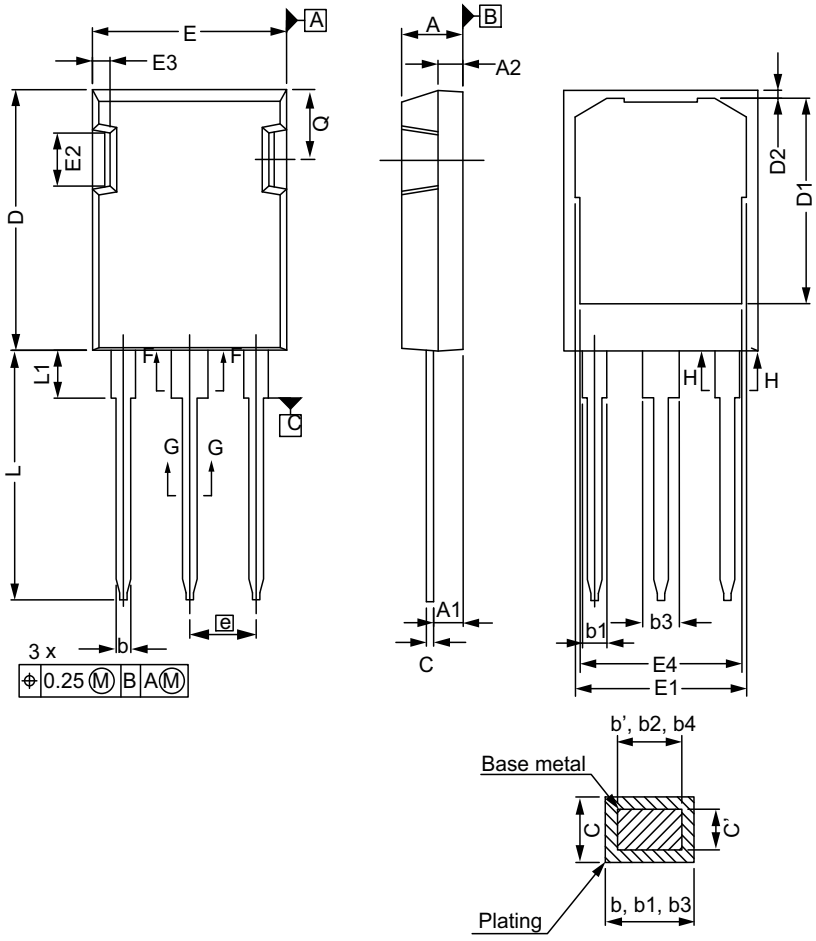
- Dimensioning and tolerancing per ASME Y14.5M-1994
- Dimension D and E do not include mold flash. Mold flash shall not exceed 0.127 mm (0.005") per side. These dimensions are measured at the outer extremes of the plastic body
- Outline conforms to JEDEC® outline to TO-274AA

(1) Dimension measured at tip of lead

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VERSION 2: FACILITY CODE = N



SECTION "F-F", "G-G" AND "H-H"
SCALE: NONE

	MILLIMETERS	
DIM.	MIN.	MAX.
A	4.83	5.21
A1	2.29	2.54
A2	1.91	2.16
b'	1.07	1.28
b	1.07	1.33
b1	1.91	2.41
b2	1.91	2.16
b3	2.87	3.38
b4	2.87	3.13
c'	0.55	0.65
c	0.55	0.68
D	20.80	21.10

	MILLIMETERS	
DIM.	MIN.	MAX.
D1	16.25	17.65
D2	0.50	0.80
E	15.75	16.13
E1	13.10	14.15
E2	3.68	5.10
E3	1.00	1.90
E4	12.38	13.43
e	5.44 BSC	
N	3	
L	19.81	20.32
L1	3.70	4.00
Q	5.49	6.00

ECN: E20-0538-Rev. C, 19-Oct-2020
DWG: 5975

Notes

- Dimensioning and tolerancing per ASME Y14.5M-1994
- Outline conforms to JEDEC® outline to TO-274AD
- Dimensions are measured in mm, angles are in degree
- Metal surfaces are tin plated, except area of cut

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Elektronik komponent tedarikinde Entegreci

Entegreci, Eskişehir merkezli, Türkiye geneline satış yapan bir elektronik komponent mağazasıdır. Entegreler (IC), mikrodenetleyiciler, transistörler, diyotlar, pasif elemanlar, konnektörler, modüller ve geliştirme kartları tek adetten seri üretim adetlerine kadar satılır. Ürün sayfalarında güncel stok durumunu, fiyatı ve datasheet bağlantısını bulabilirsiniz.

Parça koduyla arama

Üretici parça numarasını yazın; stok ve fiyatı hemen görün.

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Ürün kategorileri

Entegreden kapasitöre tüm elektronik komponent kategorileri.

Kategorilere göz atın

Üreticiler

Aradığınız üreticinin ürünlerini tek sayfada inceleyin.

Üreticileri görün

Toplu alım ve teklif

Listede olmayan ya da yüksek adetli parçalar için teklif isteyin.

Teklif isteyin

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Entegreci is an online electronic components store based in Türkiye. Search by manufacturer part number to see stock, prices and datasheets for integrated circuits, microcontrollers, transistors, passive components and connectors, or request a quote for parts that are not listed.

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