

N-Channel 16V (D-S) MOSFET

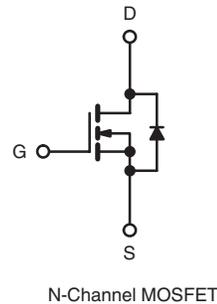
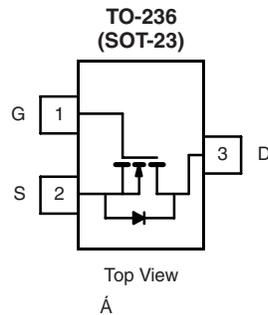
PRODUCT SUMMARY				
$V_{(BR)DSS}$ Min (V)	$r_{DS(on)}$ Max (Ω)	$V_{GS(th)}$ (V)	I_D (A)	
			DTS03K16	DTS03K16A
16	1.0 @ $V_{GS} = 10$ V	1.0 to 3.0	0.42	0.64
	1.4 @ $V_{GS} = 4.5$ V		0.35	0.53

FEATURES

- TrenchFET® Power MOSFET

APPLICATIONS

- Direct Logic-Level Interface: TTL/CMOS
- Drivers: Relays, Solenoids, Lamps, Hammers, Displays, Memories, Transistors, etc.
- Battery Operated Systems
- Solid-State Relays



ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)					
Parameter	Symbol	Limit		Unit	
		DTS03K16	DTS03K16A		
Drain-Source Voltage	V_{DS}	16		V	
Gate-Source Voltage	V_{GS}	± 8		V	
Continuous Drain Current ($T_J = 150^\circ\text{C}$)	I_D	$T_A = 25^\circ\text{C}$	0.42	0.64	A
		$T_A = 70^\circ\text{C}$	0.33	0.51	
Pulsed Drain Current ^a	I_{DM}	0.8	1.5	A	
Power Dissipation	P_D	$T_A = 25^\circ\text{C}$	0.35	0.8	W
		$T_A = 70^\circ\text{C}$	0.22	0.51	
Thermal Resistance, Junction-to-Ambient	R_{thJA}	357	156	$^\circ\text{C}/\text{W}$	
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55 to 150		$^\circ\text{C}$	

Notes
a. Pulse width limited by maximum junction temperature.

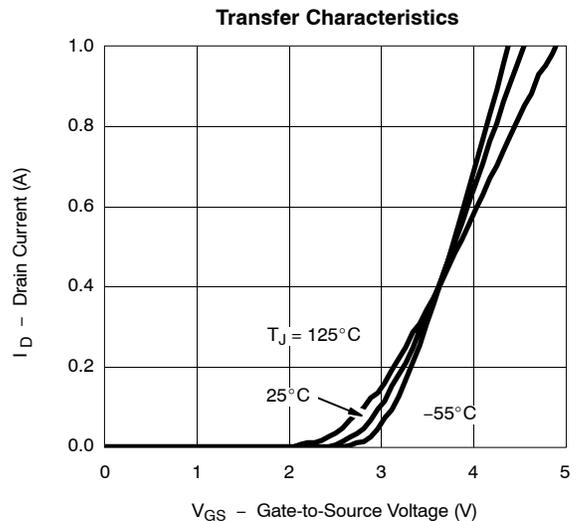
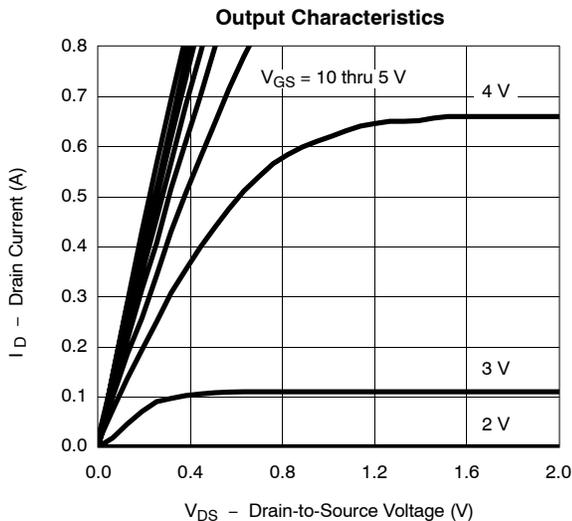
SPECIFICATIONS (T_A = 25 °C UNLESS OTHERWISE NOTED)

Parameter	Symbol	Test Conditions	Limits			Unit
			Min	Typ	Max	
Static						
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} = 0 V, I _D = 10 μA	16			V
Gate-Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 0.25 mA	1.0	2.0	3.0	
Gate-Body Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ± 20 V			± 100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 16 V, V _{GS} = 0 V			1	μA
		V _{DS} = 16 V, V _{GS} = 0 V, T _J = 55 °C			10	
On-State Drain Current ^a	I _{D(on)}	V _{DS} = 10 V, V _{GS} = 8 V ^c	DTS03K16	0.5		A
			DTS03K16A	0.8		
Drain-Source On-Resistance ^a	r _{DS(on)}	V _{GS} = 4.5 V, I _D = 0.1 A		0.8	1.4	Ω
		V _{GS} = 10 V, I _D = 0.3 A		0.47	1.0	
Forward Transconductance ^a	g _{fs}	V _{DS} = 10 V, I _D = 0.3 A		550		mS
Diode Forward Voltage	V _{SD}	I _S = 0.3 A, V _{GS} = 0 V		0.85	1.2	V
Dynamic^b						
Total Gate Charge	Q _g	V _{DS} = 16 V, V _{GS} = 10 V I _D ≅ 0.3 A		1000	1500	pC
Gate-Source Charge	Q _{gs}			205		
Gate-Drain Charge	Q _{gd}			200		
Gate Resistance	R _g			48		Ω
Turn-On Time	t _{d(on)}	V _{DD} = 15 V, R _L = 50 Ω I _D ≅ 0.3 A, V _{GEN} = 10 V R _G = 6 Ω		4.5	8	ns
	t _r			8	15	
Turn-Off Time	t _{d(off)}			9	15	
	t _f			6.3	12	

Notes

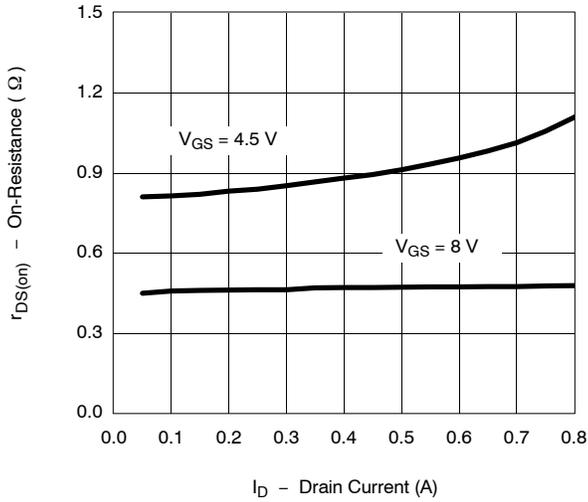
- a. Pulse test: PW ≤ 300 μs duty cycle ≤ 2%.
- b. Guaranteed by design, not subject to production testing.

TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)

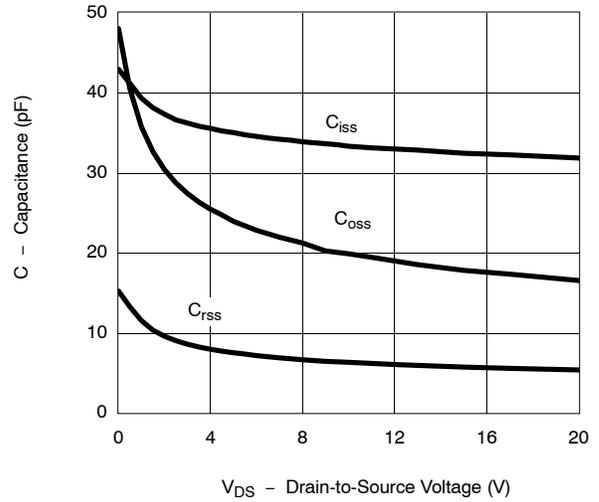


TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

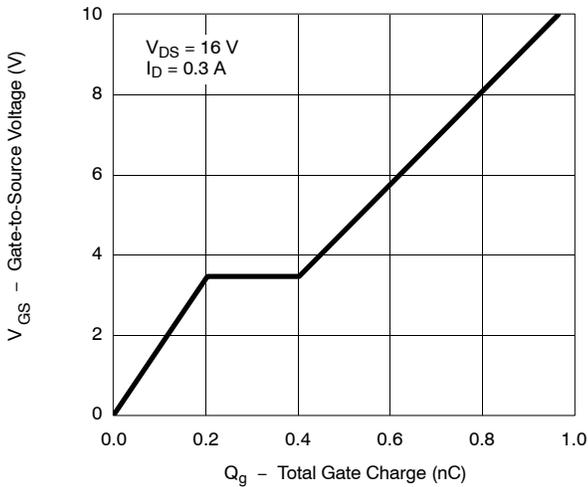
On-Resistance vs. Drain Current



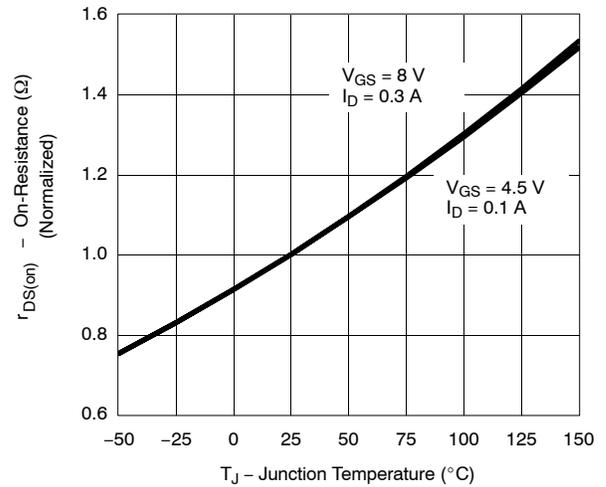
Capacitance



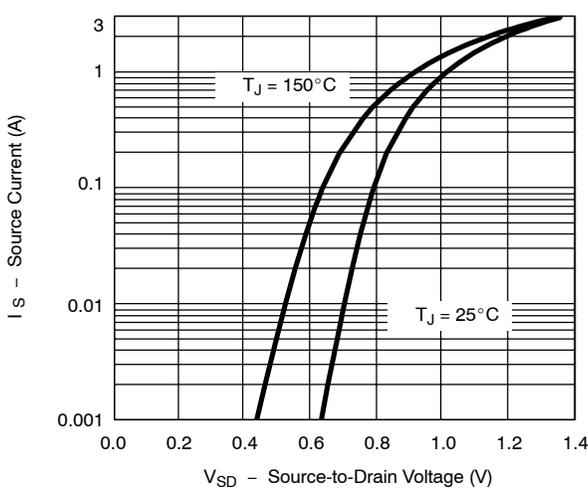
Gate Charge



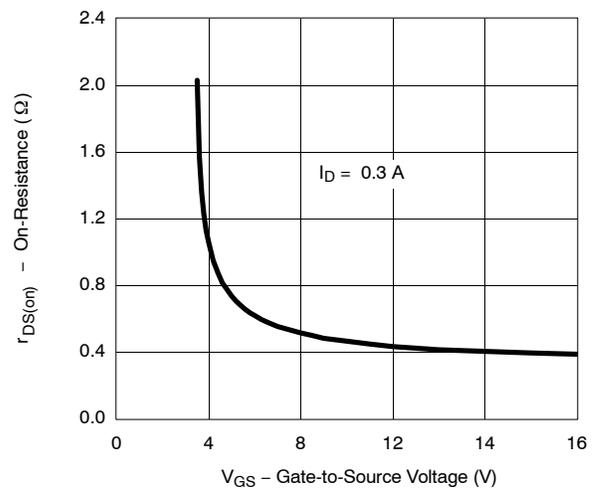
On-Resistance vs. Junction Temperature



Source-Drain Diode Forward Voltage

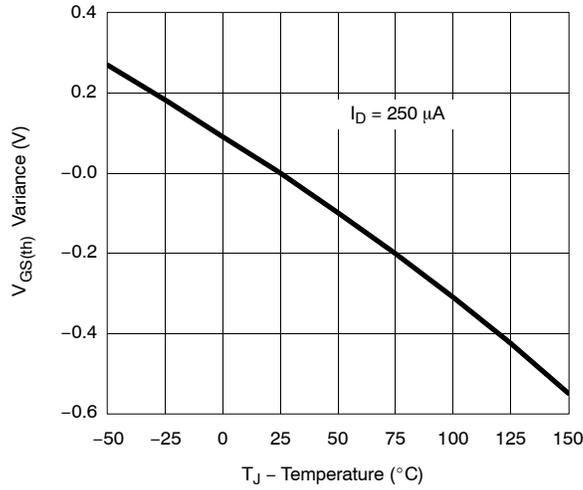


On-Resistance vs. Gate-to-Source Voltage

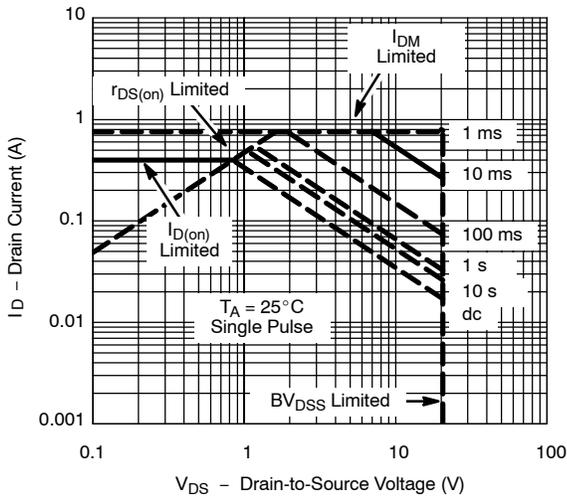


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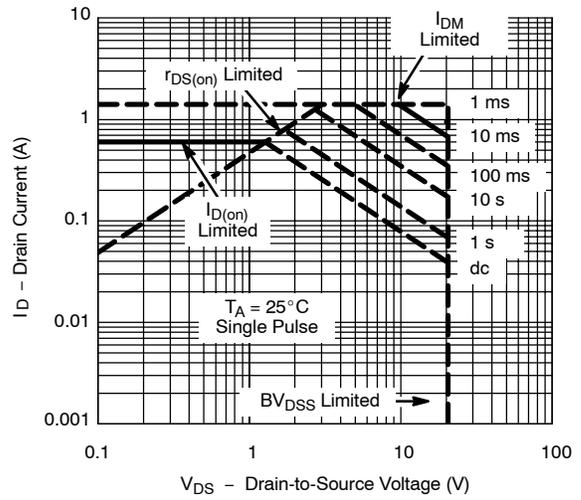
Threshold Voltage



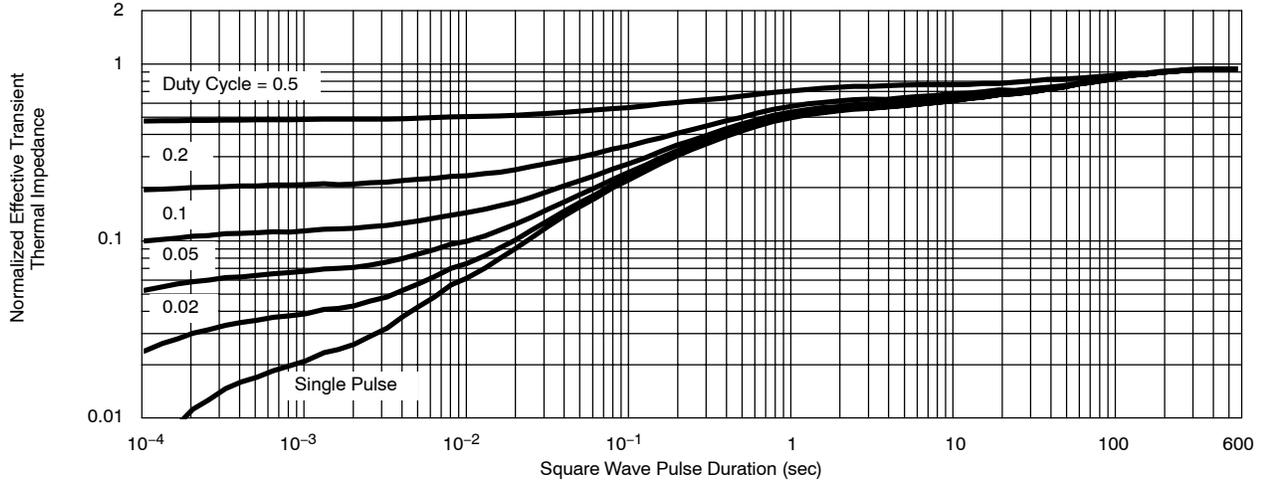
Safe Operating Area (TO-236, DTS03K16 Only)



Safe Operating Area (TO-226AA, DTS03K16A Only)

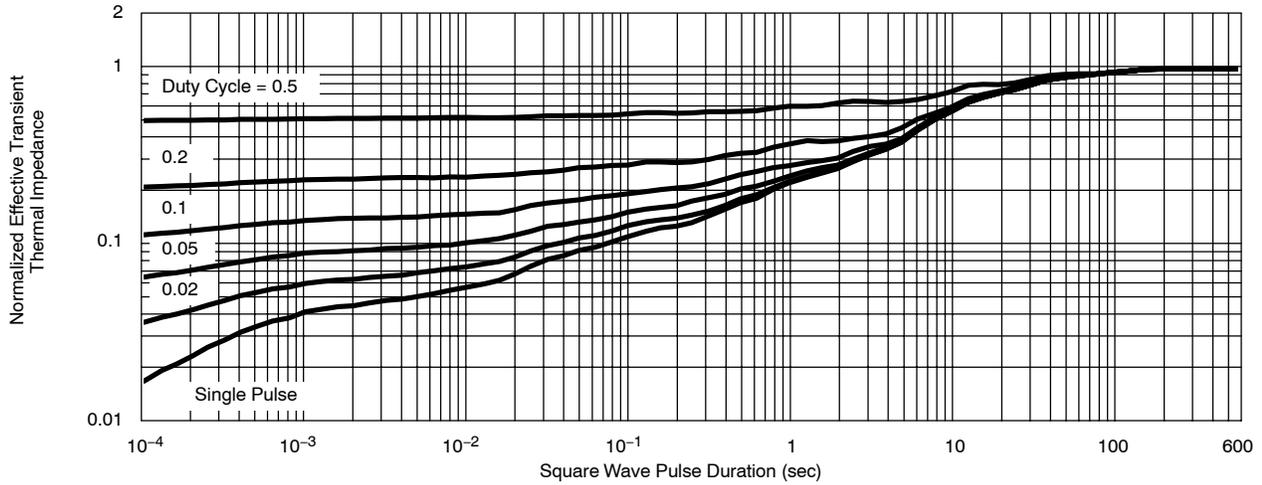


Normalized Thermal Transient Impedance, Junction-to-Ambient (TO-236, DTS03K16 Only)

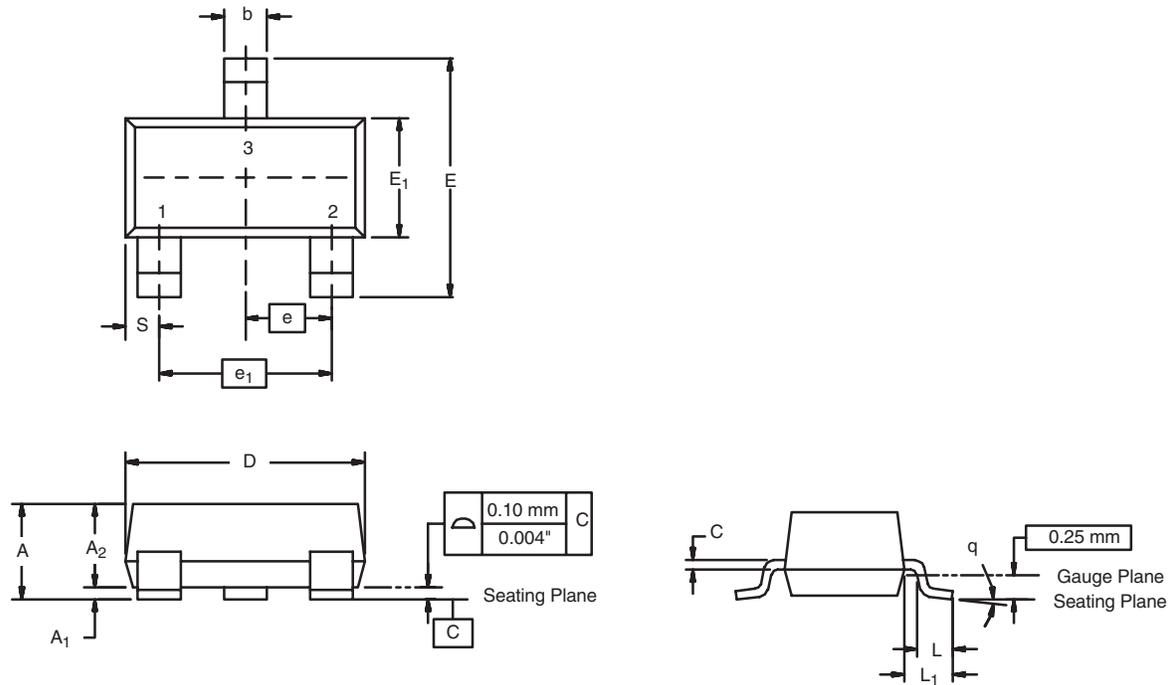


TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

Normalized Thermal Transient Impedance, Junction-to-Ambient (TO-226AA, DTS03K16A Only)



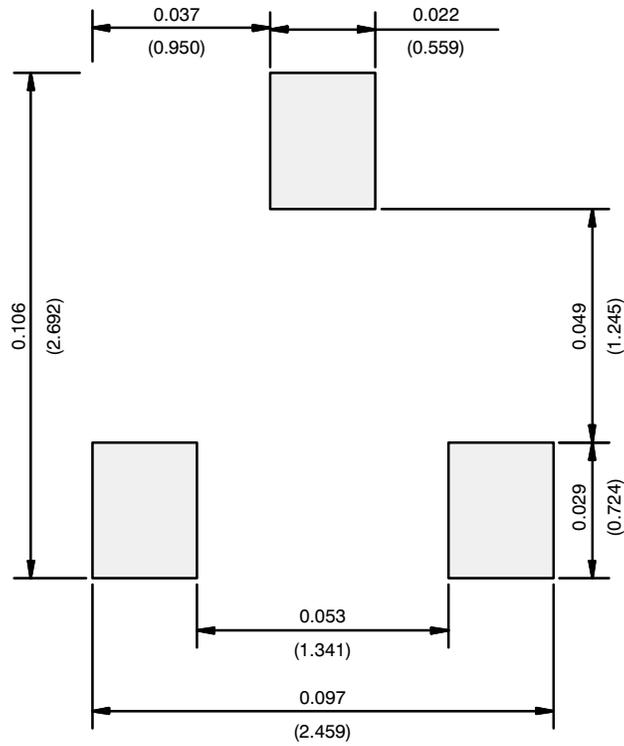
SOT-23 (TO-236): 3-LEAD



Dim	MILLIMETERS		INCHES	
	Min	Max	Min	Max
A	0.89	1.12	0.035	0.044
A ₁	0.01	0.10	0.0004	0.004
A ₂	0.88	1.02	0.0346	0.040
b	0.35	0.50	0.014	0.020
c	0.085	0.18	0.003	0.007
D	2.80	3.04	0.110	0.120
E	2.10	2.64	0.083	0.104
E ₁	1.20	1.40	0.047	0.055
e	0.95 BSC		0.0374 Ref	
e ₁	1.90 BSC		0.0748 Ref	
L	0.40	0.60	0.016	0.024
L ₁	0.64 Ref		0.025 Ref	
S	0.50 Ref		0.020 Ref	
q	3°	8°	3°	8°

ECN: S-03946-Rev. K, 09-Jul-01
DWG: 5479

RECOMMENDED MINIMUM PADS FOR SOT-23



Recommended Minimum Pads
Dimensions in Inches/(mm)

[Return to Index](#)

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