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

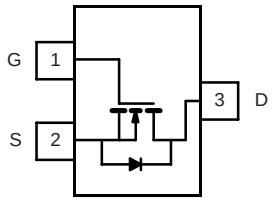
FEATURES

- TrenchFET® Power MOSFET

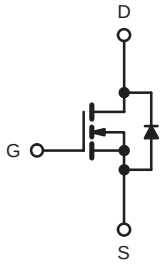
APPLICATIONS

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

TO-236
(SOT-23)



Top View



N-Channel MOSFET

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

Notes
a. Pulse width limited by maximum junction temperature.

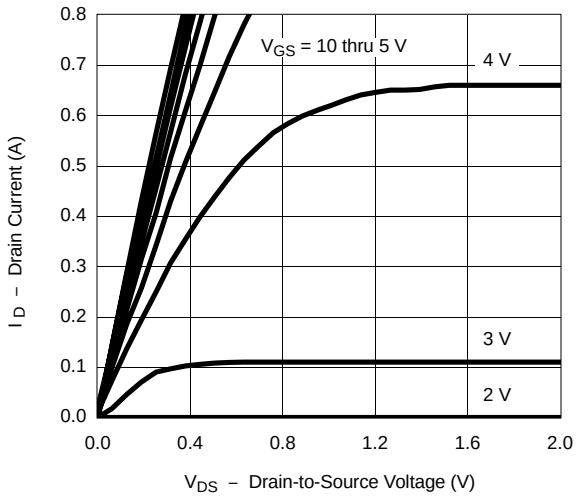
SPECIFICATIONS (T_A = 25°C UNLESS OTHERWISE NOTED)

Parameter	Symbol	Test Conditions		Limits Min	Limits Typ	Limits Max	Unit
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	V
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	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	

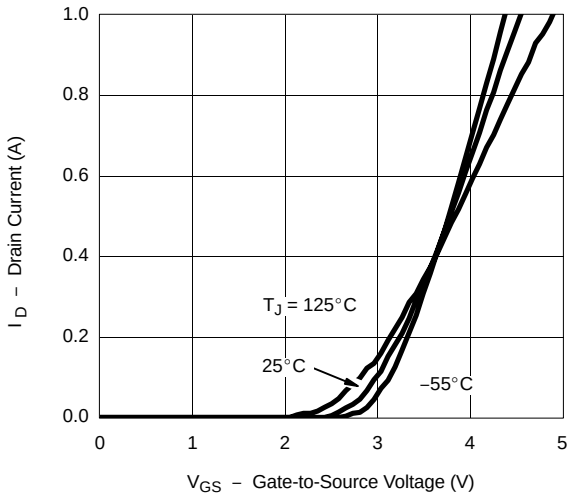
Notes
a. Pulse test: PW ≤ 300 µs duty cycle ≤ 2%.
b. Guaranteed by design, not subject to production testing.

TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

Output Characteristics

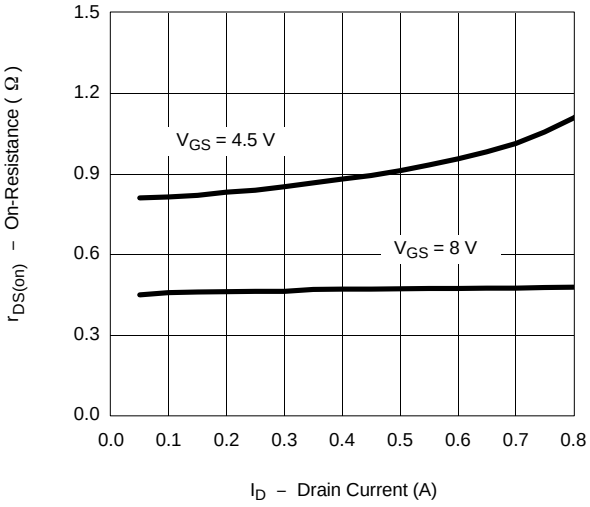


Transfer Characteristics

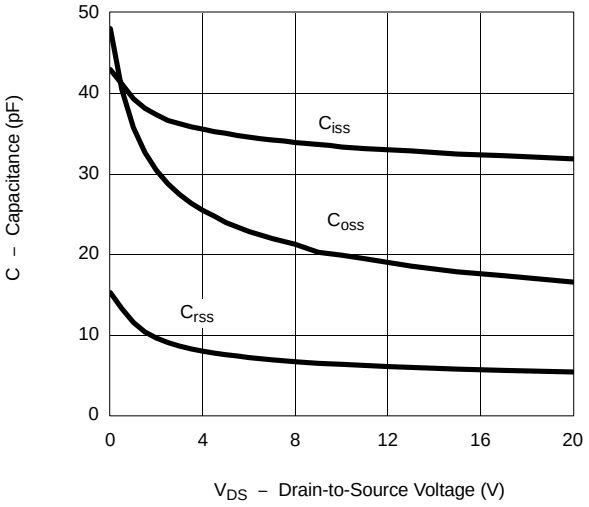


TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

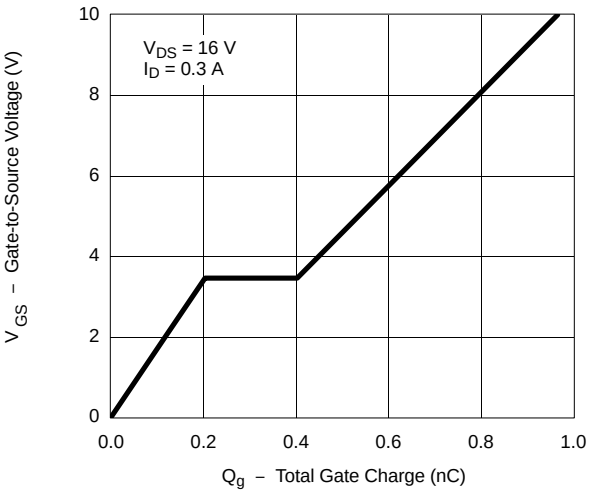
On-Resistance vs. Drain Current



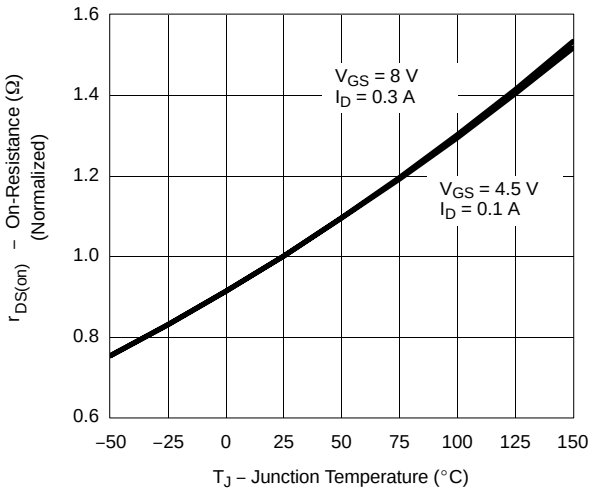
Capacitance



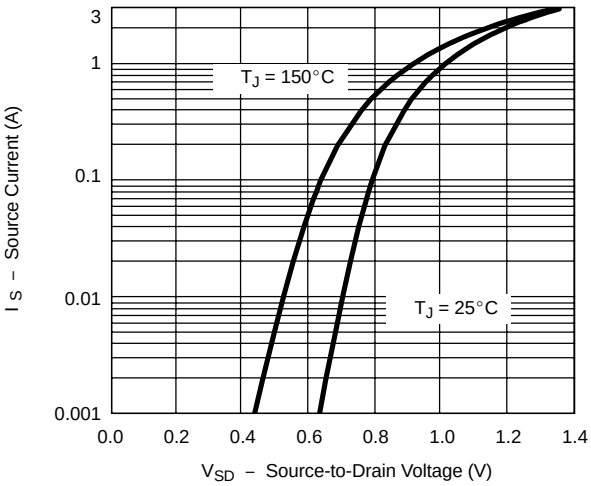
Gate Charge



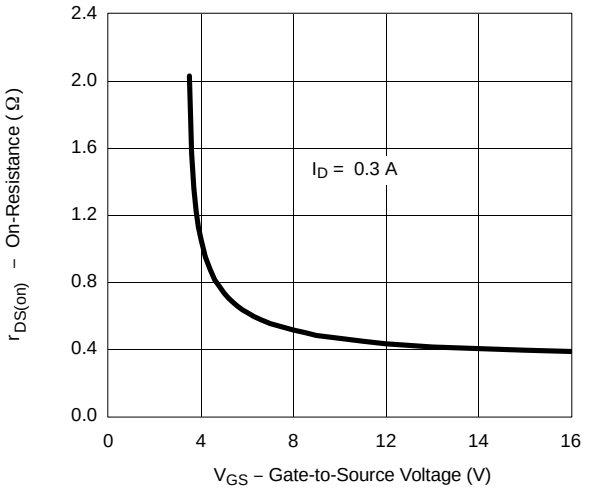
On-Resistance vs. Junction Temperature



Source-Drain Diode Forward Voltage

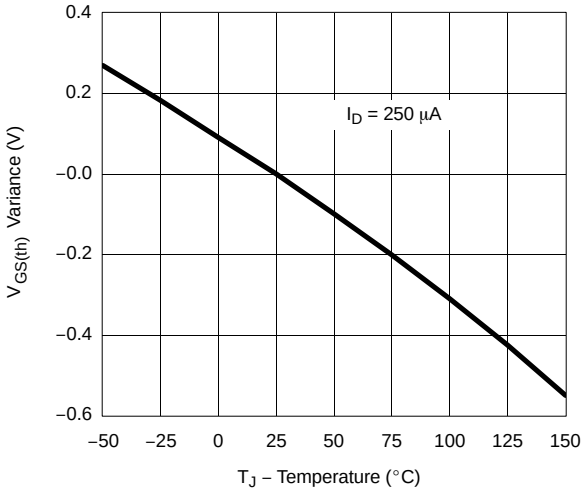


On-Resistance vs. Gate-to-Source Voltage

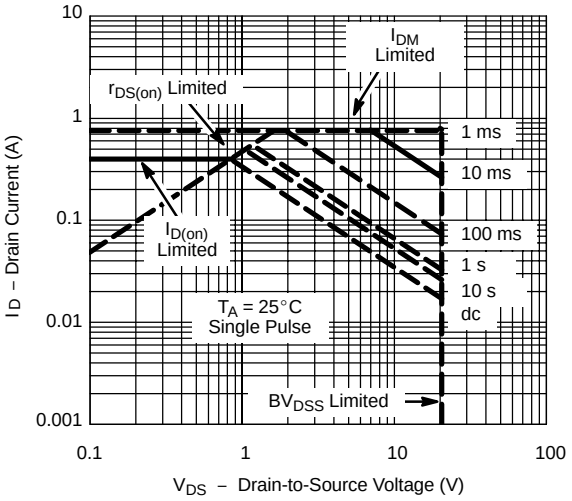


TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

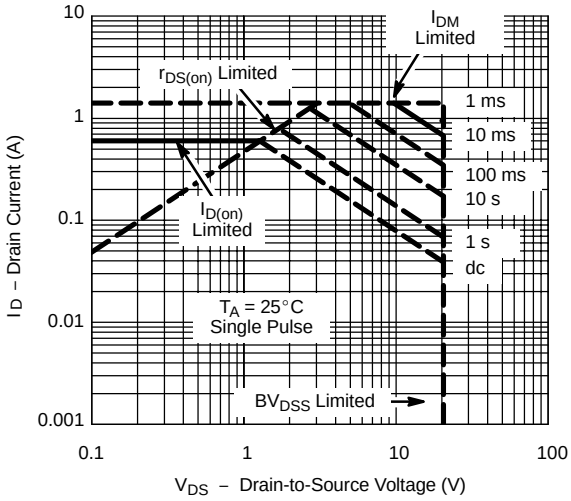
Threshold Voltage



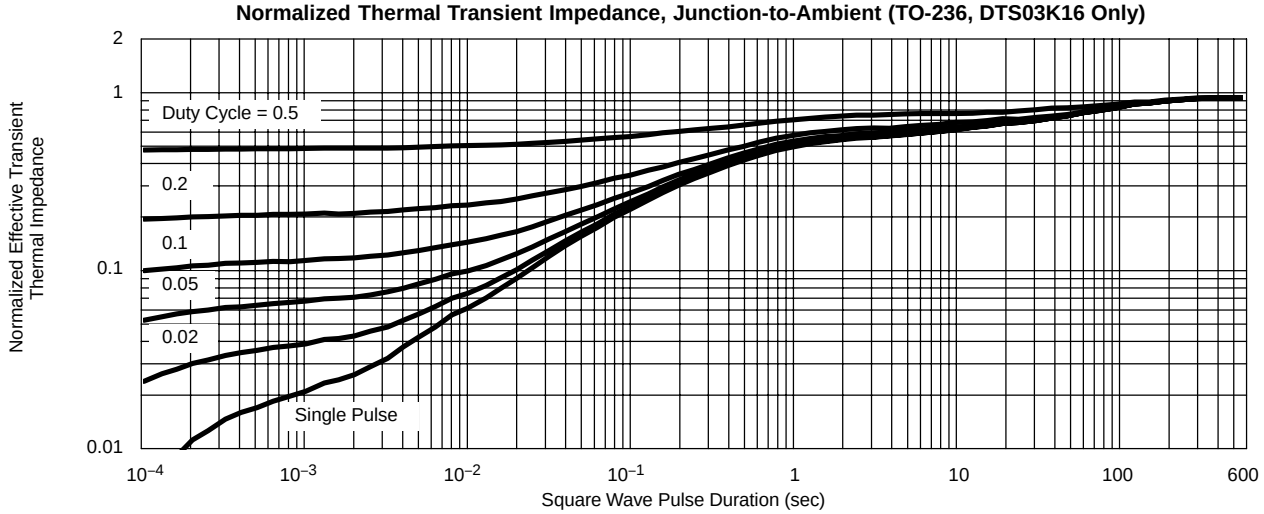
Safe Operating Area (TO-236, DTS03K16 Only)



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

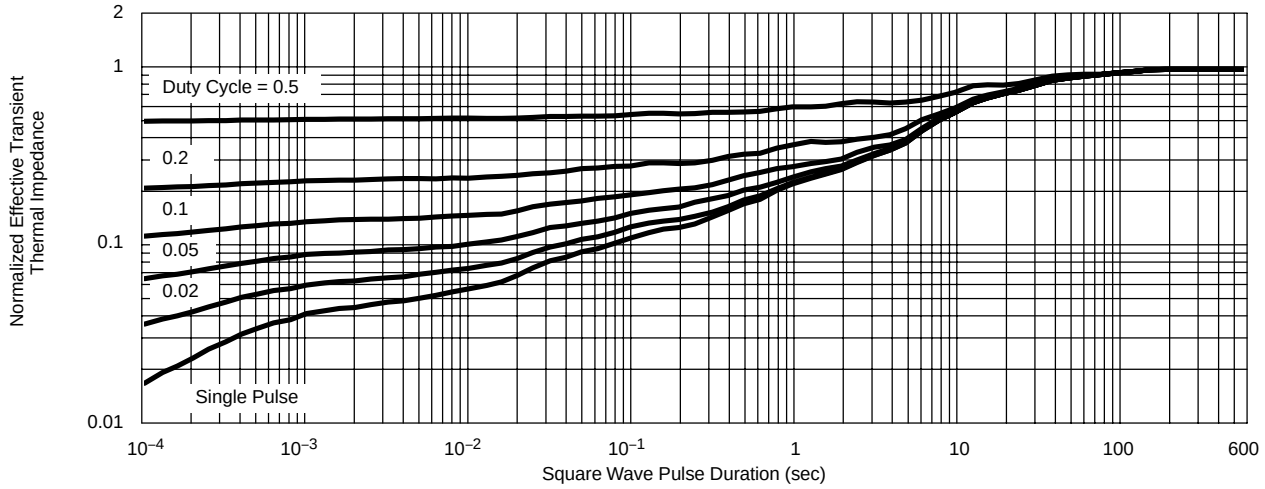


Normalized Thermal Transient Impedance, Junction-to-Ambient (TO-236, DTS03K16 Only)

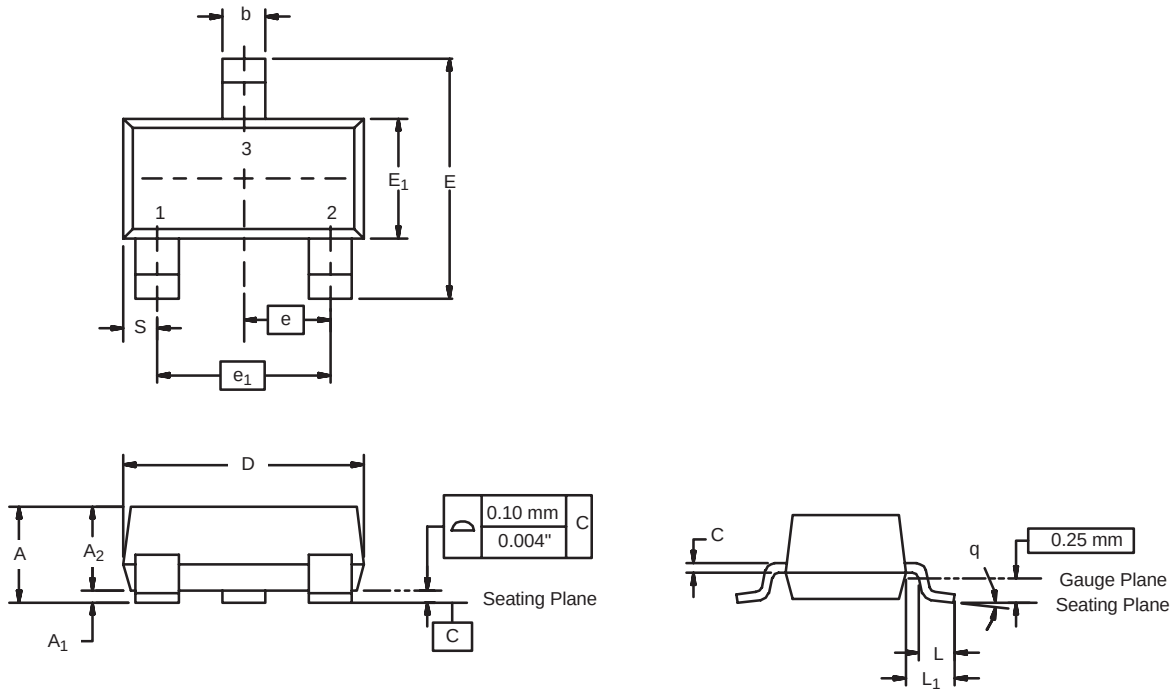


TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

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

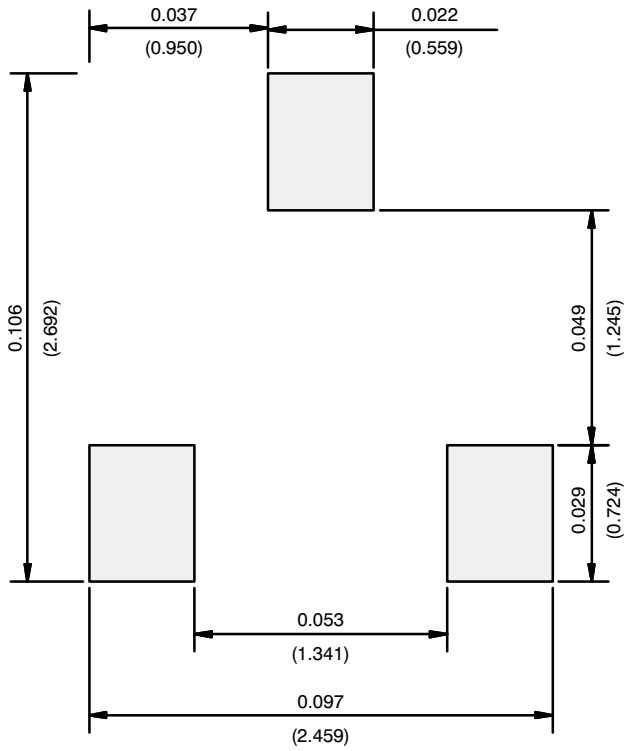


SOT-23 (TO-236): 3-LEAD



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)

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