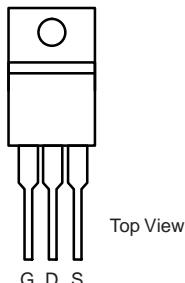


N-Channel 80 V (D-S) MOSFET

PRODUCT SUMMARY		
V_{DS}	80	V
$R_{DS(on)}$ $V_{GS} = 10$ V	7	$m\Omega$
$R_{DS(on)}$ $V_{GS} = 4.5$ V	9	$m\Omega$
I_D	100	A
Configuration	Single	

TO-220AB



Top View

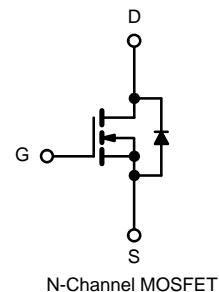
FEATURES

- TrenchFET® Power MOSFET
- 100 % R_g and UIS Tested



APPLICATIONS

- Primary Side Switching
- Synchronous Rectification
- DC/AC Inverters
- LED Backlighting



N-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS ($T_A = 25$ °C, unless otherwise noted)					
Parameter	Symbol	Limit	Unit		
Drain-Source Voltage	V_{DS}	80	V		
Gate-Source Voltage	V_{GS}	± 20			
Continuous Drain Current ($T_J = 150$ °C)	I_D	100 ^a			
		85 ^a			
		28.6 ^{b, c}			
		24.9 ^{b, c}			
Pulsed Drain Current ($t = 100$ μ s)	I_{DM}	350	A		
Continuous Source-Drain Diode Current	I_S	80 ^a			
		4.5 ^{b, c}			
Single Pulse Avalanche Current	I_{AS}	30			
Single Pulse Avalanche Energy	E_{AS}	45	mJ		
Maximum Power Dissipation	P_D	180			
		120			
		5 ^{b, c}			
		3.2 ^{b, c}			
Operating Junction and Storage Temperature Range	T_J, T_{stg}	- 55 to 150		°C	
Soldering Recommendations (Peak Temperature)		260			

THERMAL RESISTANCE RATINGS					
Parameter	Symbol	Typical	Maximum	Unit	
Maximum Junction-to-Ambient ^a	R_{thJA}	15	18	°C/W	
		40	50		
Maximum Junction-to-Case	R_{thJC}	0.85	1.1		

Notes

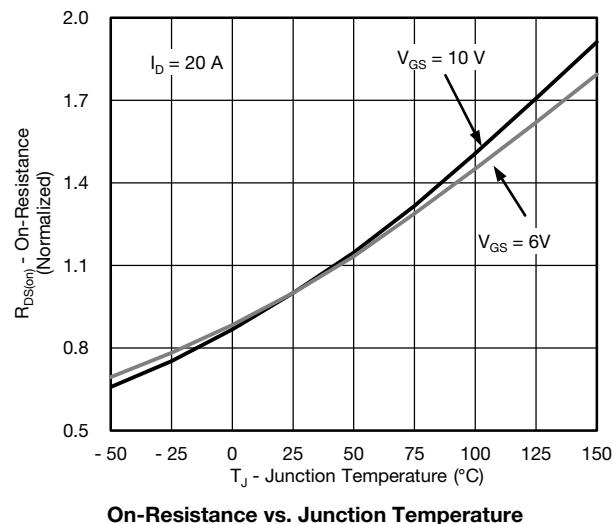
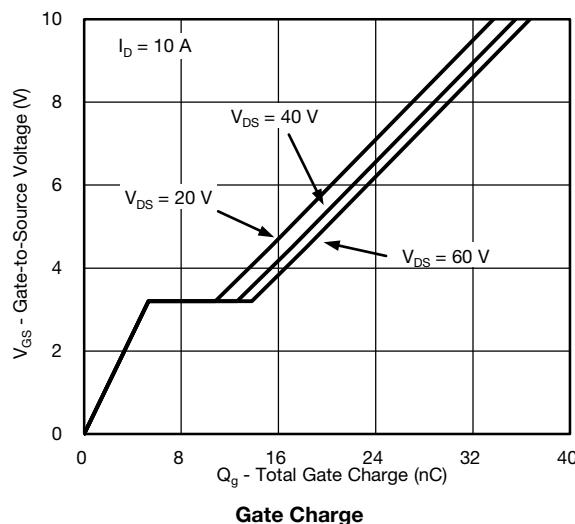
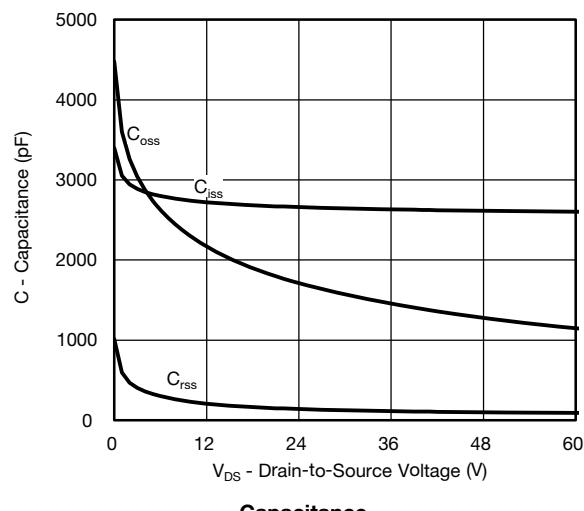
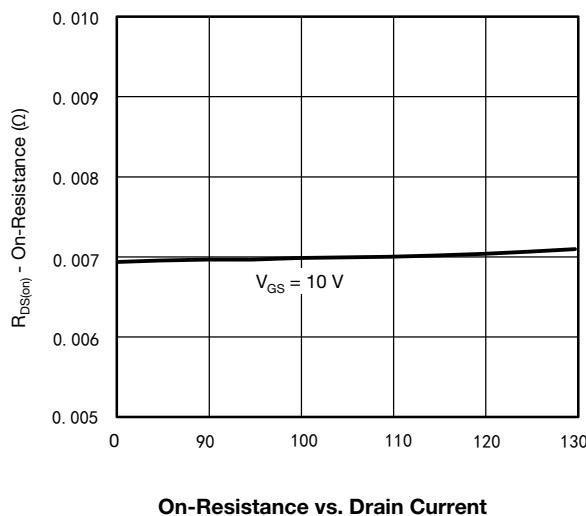
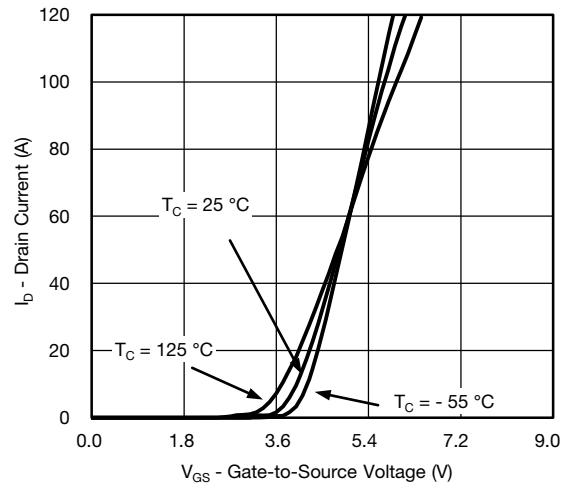
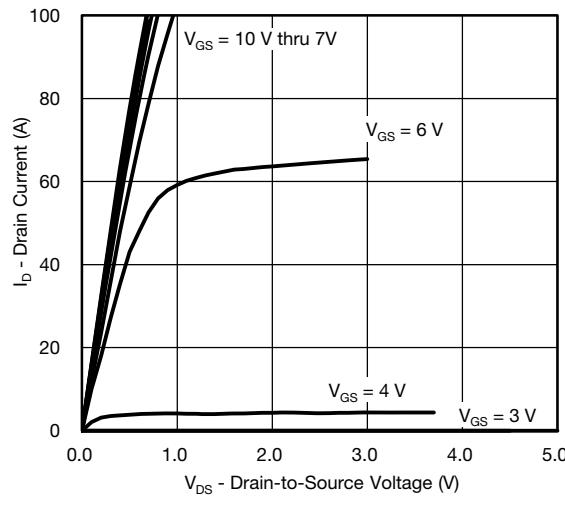
- a. Package limited.
- b. Surface mounted on 1" x 1" FR4 board.
- c. $t = 10$ s.

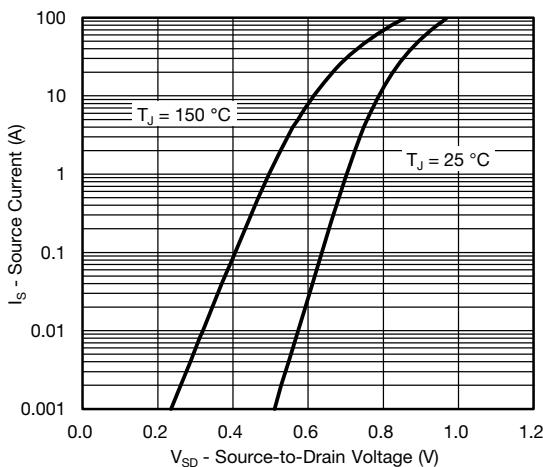
SPECIFICATIONS ($T_J = 25^\circ\text{C}$, unless otherwise noted)						
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static						
Drain-Source Breakdown Voltage	V_{DS}	$V_{GS} = 0 \text{ V}, I_D = 250 \mu\text{A}$	80			V
V_{DS} Temperature Coefficient	$\Delta V_{DS}/T_J$	$I_D = 250 \mu\text{A}$		37		mV/°C
$V_{GS(\text{th})}$ Temperature Coefficient	$\Delta V_{GS(\text{th})}/T_J$			- 6.1		
Gate-Source Threshold Voltage	$V_{GS(\text{th})}$	$V_{DS} = V_{GS}, I_D = 250 \mu\text{A}$	2.0		3.5	V
Gate-Source Leakage	I_{GSS}	$V_{DS} = 0 \text{ V}, V_{GS} = \pm 20 \text{ V}$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 80 \text{ V}, V_{GS} = 0 \text{ V}$			1	μA
		$V_{DS} = 80 \text{ V}, V_{GS} = 0 \text{ V}, T_J = 55^\circ\text{C}$			10	
On-State Drain Current ^a	$I_{D(\text{on})}$	$V_{DS} \geq 5 \text{ V}, V_{GS} = 10 \text{ V}$	85			A
Drain-Source On-State Resistance ^a	$R_{DS(\text{on})}$	$V_{GS} = 10 \text{ V}, I_D = 20 \text{ A}$		7		mΩ
		$V_{GS} = 6 \text{ V}, I_D = 15 \text{ A}$		7.5		
		$V_{GS} = 4.5 \text{ V}, I_D = 10 \text{ A}$		9		
Forward Transconductance ^a	g_{fs}	$V_{DS} = 10 \text{ V}, I_D = 20 \text{ A}$		60		S
Dynamic^b						
Input Capacitance	C_{iss}	$V_{DS} = 40 \text{ V}, V_{GS} = 0 \text{ V}, f = 1 \text{ MHz}$		3855		pF
Output Capacitance	C_{oss}			1120		
Reverse Transfer Capacitance	C_{rss}			376		
Total Gate Charge	Q_g	$V_{DS} = 40 \text{ V}, V_{GS} = 10 \text{ V}, I_D = 10 \text{ A}$		35.5		nC
		$V_{DS} = 40 \text{ V}, V_{GS} = 6 \text{ V}, I_D = 10 \text{ A}$		22		
		$V_{DS} = 40 \text{ V}, V_{GS} = 4.5 \text{ V}, I_D = 10 \text{ A}$		18		
Gate-Source Charge	Q_{gs}			5.3		nC
Gate-Drain Charge	Q_{gd}			7.3		
Output Charge	Q_{oss}	$V_{DS} = 40 \text{ V}, V_{GS} = 0 \text{ V}$		57	86	nC
Gate Resistance	R_g	$f = 1 \text{ MHz}$	0.5	1.3	2	Ω
Turn-On Delay Time	$t_{d(\text{on})}$			12	24	ns
Rise Time	t_r			8	16	
Turn-Off Delay Time	$t_{d(\text{off})}$	$I_D = 10 \text{ A}, V_{GEN} = 10 \text{ V}, R_g = 1 \Omega$		32	64	ns
Fall Time	t_f			7	14	
Turn-On Delay Time	$t_{d(\text{on})}$			14	28	
Rise Time	t_r	$I_D = 10 \text{ A}, V_{GEN} = 6.0 \text{ V}, R_g = 1 \Omega$		11	22	ns
Turn-Off Delay Time	$t_{d(\text{off})}$			30	60	
Fall Time	t_f			8	16	
Drain-Source Body Diode Characteristics						
Continuous Source-Drain Diode Current	I_S	$T_C = 25^\circ\text{C}$			75	A
Pulse Diode Forward Current ($t = 100 \mu\text{s}$)	I_{SM}				150	
Body Diode Voltage	V_{SD}	$I_S = 5 \text{ A}$		0.76	1.1	V
Body Diode Reverse Recovery Time	t_{rr}	$I_F = 10 \text{ A}, dI/dt = 100 \text{ A}/\mu\text{s}, T_J = 25^\circ\text{C}$		38	75	ns
Body Diode Reverse Recovery Charge	Q_{rr}			36	70	
Reverse Recovery Fall Time	t_a			19		ns
Reverse Recovery Rise Time	t_b			19		

Notes

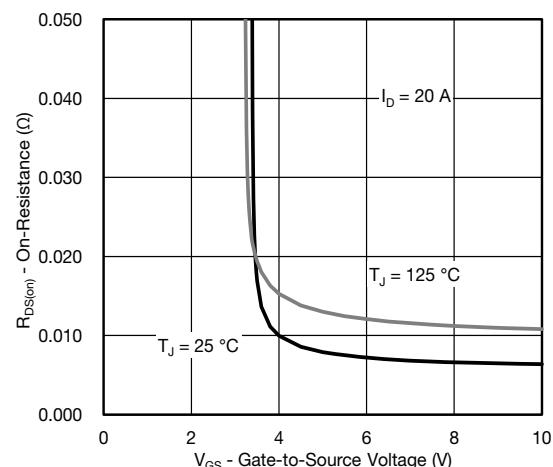
- a. Pulse test; pulse width $\leq 300 \mu\text{s}$, duty cycle $\leq 2 \%$.
- b. Guaranteed by design, not subject to production testing.

Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

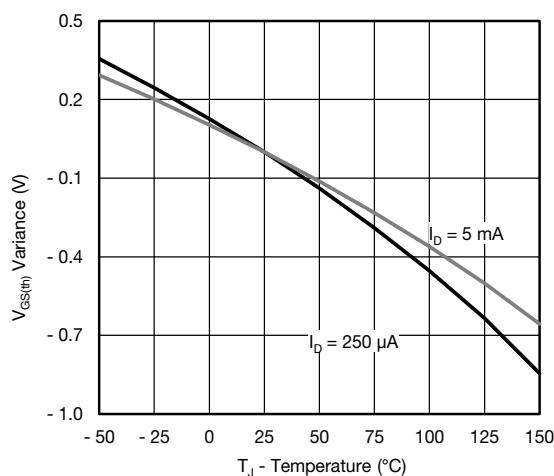
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)


TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)


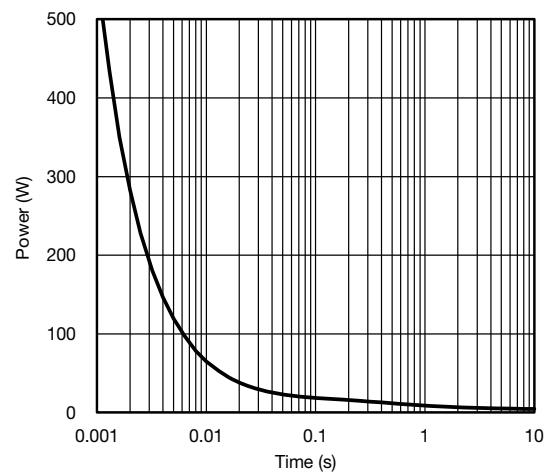
Source-Drain Diode Forward Voltage



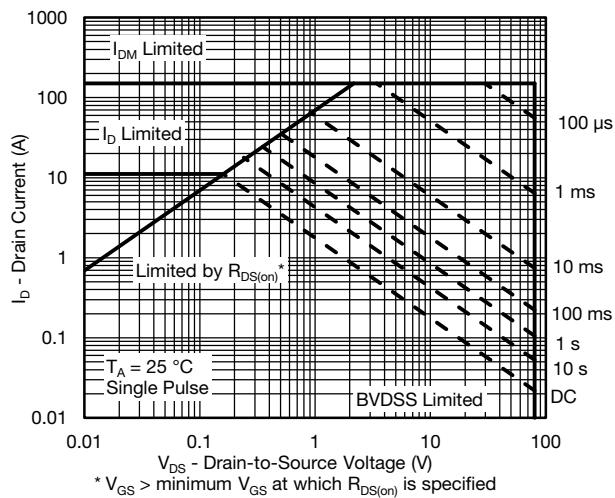
On-Resistance vs. Gate-to-Source Voltage



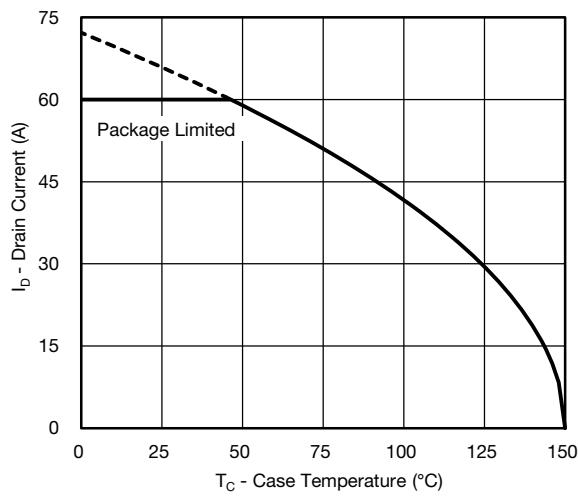
Threshold Voltage



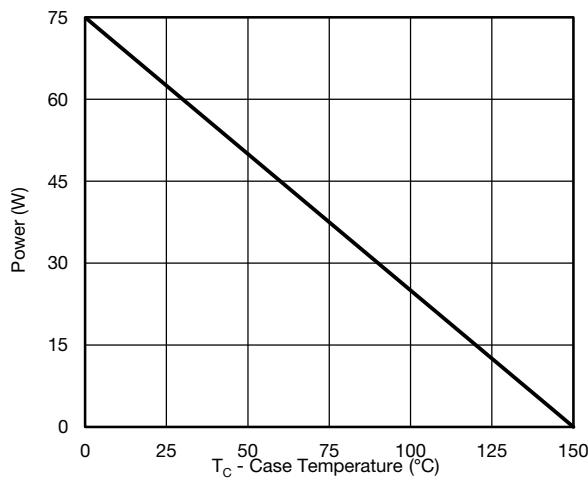
Single Pulse Power, Junction-to-Ambient



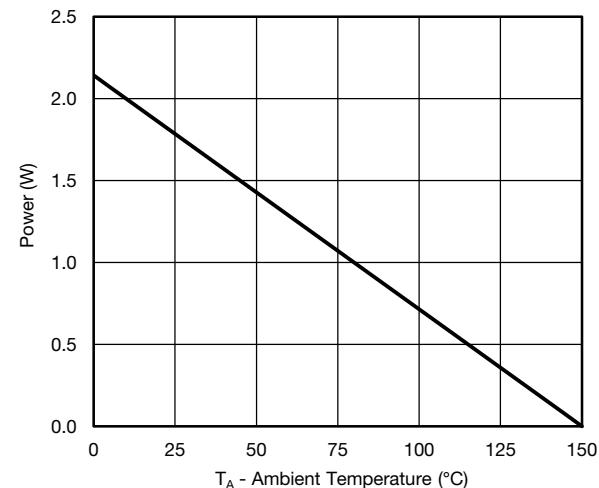
Safe Operating Area, Junction-to-Ambient

TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)


Current Derating*

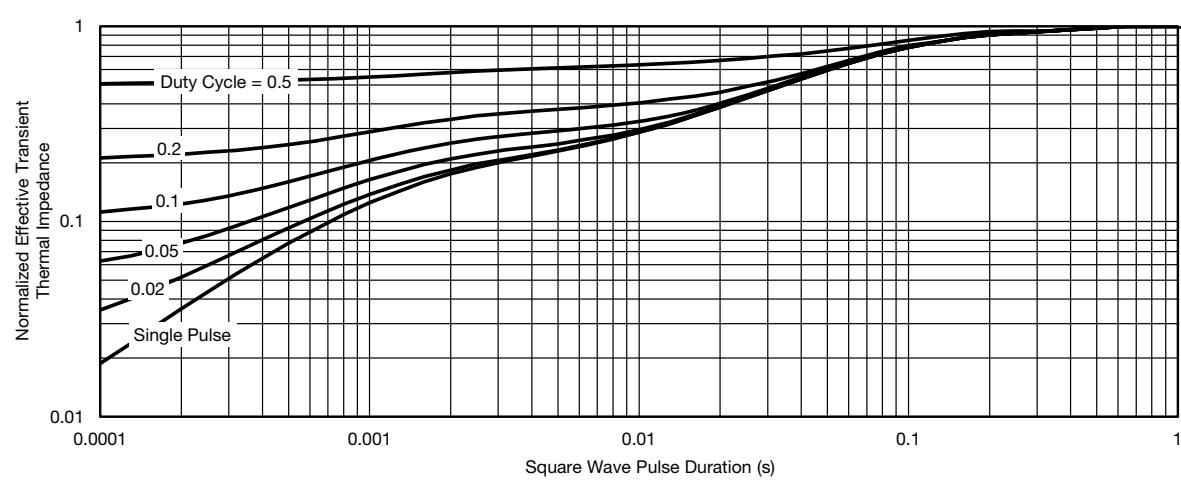
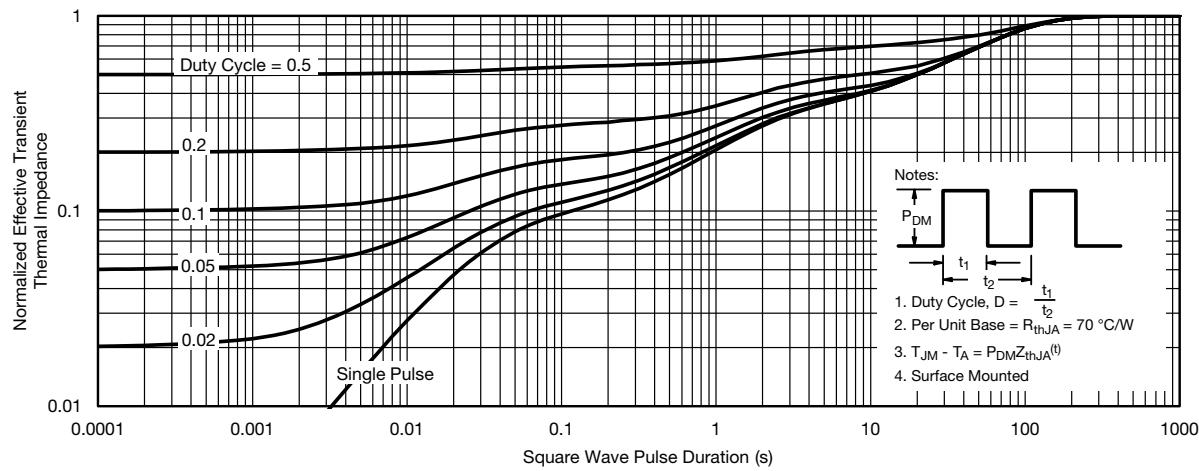


Power, Junction-to-Case

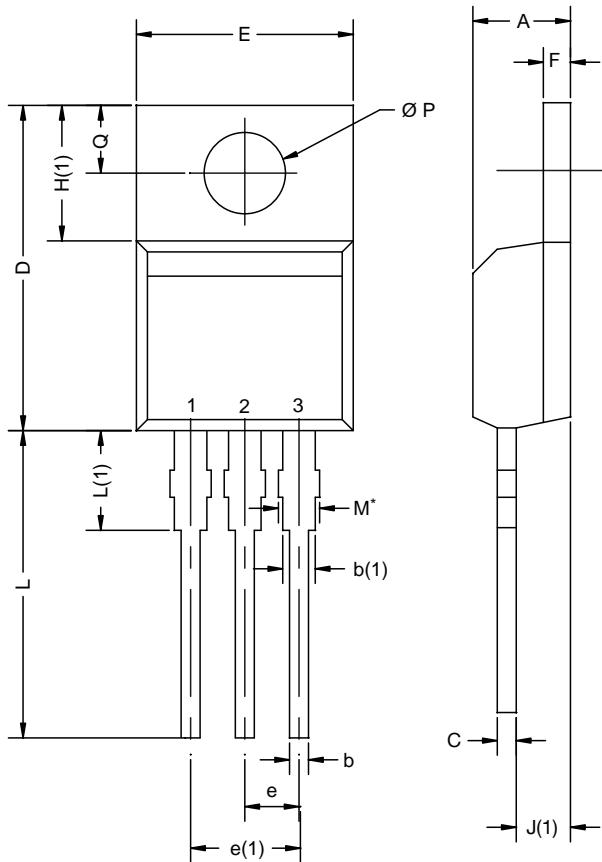


Power, Junction-to-Ambient

* The power dissipation P_D is based on $T_{J(max.)} = 150$ °C, using junction-to-case thermal resistance, and is more useful in settling the upper dissipation limit for cases where additional heatsinking is used. It is used to determine the current rating, when this rating falls below the package limit.

TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)


TO-220AB



DIM.	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	4.25	4.65	0.167	0.183
b	0.69	1.01	0.027	0.040
b(1)	1.20	1.73	0.047	0.068
c	0.36	0.61	0.014	0.024
D	14.85	15.49	0.585	0.610
E	10.04	10.51	0.395	0.414
e	2.41	2.67	0.095	0.105
e(1)	4.88	5.28	0.192	0.208
F	1.14	1.40	0.045	0.055
H(1)	6.09	6.48	0.240	0.255
J(1)	2.41	2.92	0.095	0.115
L	13.35	14.02	0.526	0.552
L(1)	3.32	3.82	0.131	0.150
ØP	3.54	3.94	0.139	0.155
Q	2.60	3.00	0.102	0.118

ECN: X12-0208-Rev. N, 08-Oct-12
DWG: 5471

Notes

* M = 1.32 mm to 1.62 mm (dimension including protrusion)
Heatsink hole for HVM

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