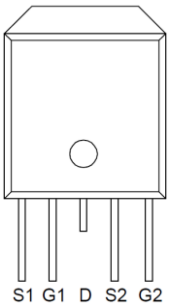
N & P-Channel 40-V (D-S) MOSFET

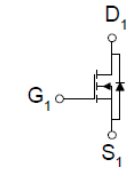
PRODUCT SUMMARY		
V_{DS} (V)	$r_{DS(on)}$ (mΩ)	I_D (A)
40	36 @ V_{GS} = 10V	30
	46 @ V_{GS} = 4.5V	27
-40	38 @ V_{GS} = -10V	-30
	48 @ V_{GS} = -4.5V	-26

Key Features:
- Low $r_{DS(on)}$ trench technology
- Low thermal impedance
- Fast switching speed

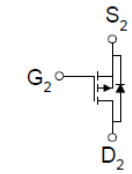
Typical Applications:
- Automotive Systems
- DC/DC Conversion Circuits
- Battery Powered Power Tools

Pb-free
RoHS COMPLIANT
HALOGEN FREE





N-Channel MOSFET



P-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C UNLESS OTHERWISE NOTED)					
Parameter		**Symbol**	**Nch Limit**	**Pch Limit**	**Units**
Drain-Source Voltage		V_{DS}	40	-40	V
Gate-Source Voltage		V_{GS}	±20	±20	
Continuous Drain Current [a]	T_C=25°C	I_D	30	-30	A
Pulsed Drain Current [b]		I_{DM}	100	-100	
Continuous Source Current (Diode Conduction) [a]	T_C=25°C	I_S	15	-15	A
Power Dissipation [a]	T_C=25°C	P_D	50	50	W
Operating Junction and Storage Temperature Range		T_J, T_{stg}	T_J, T_{stg}	-55 to 150	°C

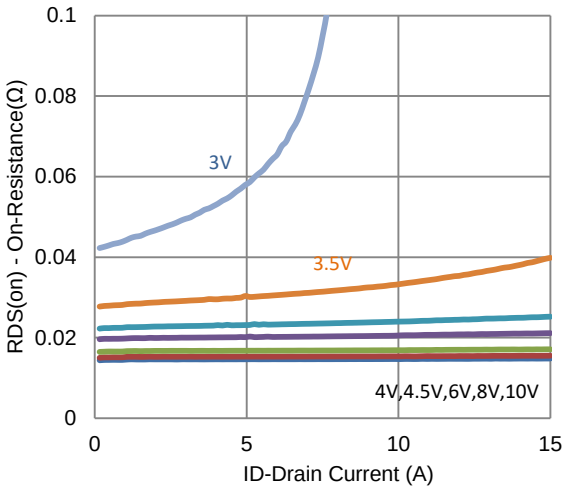
THERMAL RESISTANCE RATINGS			
Parameter	**Symbol**	**Maximum**	**Units**
Maximum Junction-to-Ambient [c]	$R_{\theta JA}$	50	°C/W
Maximum Junction-to-Case	$R_{\theta JC}$	3	

Notes
a. Package Limited
b. Pulse width limited by maximum junction temperature
c. Surface Mounted on 1” x 1” FR4 Board.

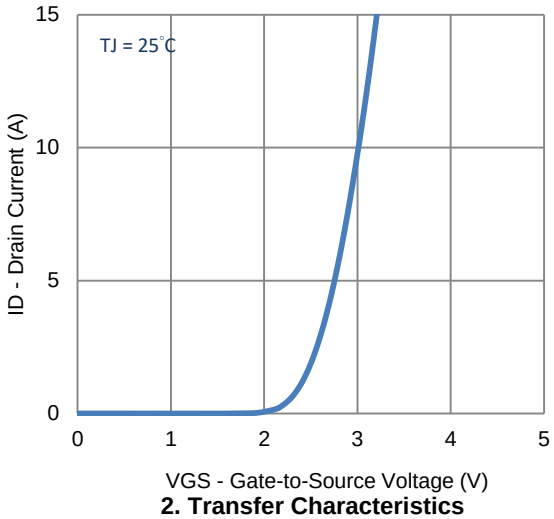
Electrical Characteristics

Parameter	Symbol	Test Conditions		Min	Typ	Max	Unit
Static							
Gate-Source Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250 uA	**(Nch)**	1			V
		V_{DS} = V_{GS}, I_D = -250 uA	**(Pch)**	-1			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} = 32 V, V_{GS} = 0 V	**(Nch)**			1	uA
		V_{DS} = -32 V, V_{GS} = 0 V	**(Pch)**			-1	
On-State Drain Current [a]	$I_{D(on)}$	V_{DS} = 5 V, V_{GS} = 10 V	**(Nch)**	10			A
		V_{DS} = -5 V, V_{GS} = -10 V	**(Pch)**	-10			A
Drain-Source On-Resistance [a]	$r_{DS(on)}$	V_{GS} = 10 V, I_D = 15 A	**(Nch)**			36	mΩ
		V_{GS} = 4.5 V, I_D = 13 A	**(Nch)**			46	
		V_{GS} = -10 V, I_D = -10 A	**(Pch)**			38	mΩ
		V_{GS} = -4.5 V, I_D = -8 A	**(Pch)**			48	
Forward Transconductance [a]	g_{fs}	V_{DS} = 15 V, I_D = 15 A	**(Nch)**		27		S
		V_{DS} = -15 V, I_D = -14 A	**(Pch)**		18		S
Diode Forward Voltage [a]	V_{SD}	I_S = 7.5 A, V_{GS} = 0 V	**(Nch)**		0.88		V
		I_S = -7.5 A, V_{GS} = 0 V	**(Pch)**		-0.93		V
Dynamic [b]							
Total Gate Charge	Q_g	N - Channel V_{DS} = 20 V, V_{GS} = 4.5 V, I_D = 10 A			12		nC
Gate-Source Charge	Q_{gs}				4.3		
Gate-Drain Charge	Q_{gd}				4.1		
Turn-On Delay Time	$t_{d(on)}$	N - Channel V_{DS} = 20 V, R_L = 2 Ω, I_D = 10 A, V_{GEN} = 10 V, R_{GEN} = 6 Ω			5		ns
Rise Time	t_r				7		
Turn-Off Delay Time	$t_{d(off)}$				35		
Fall Time	t_f				11		
Input Capacitance	C_{iss}	N - Channel V_{DS} = 15 V, V_{GS} = 0 V, f = 1 Mhz			1182		pF
Output Capacitance	C_{oss}				110		
Reverse Transfer Capacitance	C_{rss}				86		
Total Gate Charge	Q_g	P - Channel V_{DS} = -20 V, V_{GS} = -4.5 V, I_D = -10 A			15		nC
Gate-Source Charge	Q_{gs}				4.2		
Gate-Drain Charge	Q_{gd}				4.6		
Turn-On Delay Time	$t_{d(on)}$	P - Channel V_{DS} = -20 V, R_L = 2 Ω, I_D = -10 A, V_{GEN} = -10 V, R_{GEN} = 6 Ω			7		ns
Rise Time	t_r				6		
Turn-Off Delay Time	$t_{d(off)}$				52		
Fall Time	t_f				19		
Input Capacitance	C_{iss}	P - Channel V_{DS} = -15 V, V_{GS} = 0 V, f = 1 Mhz			1264		pF
Output Capacitance	C_{oss}				110		
Reverse Transfer Capacitance	C_{rss}				84		

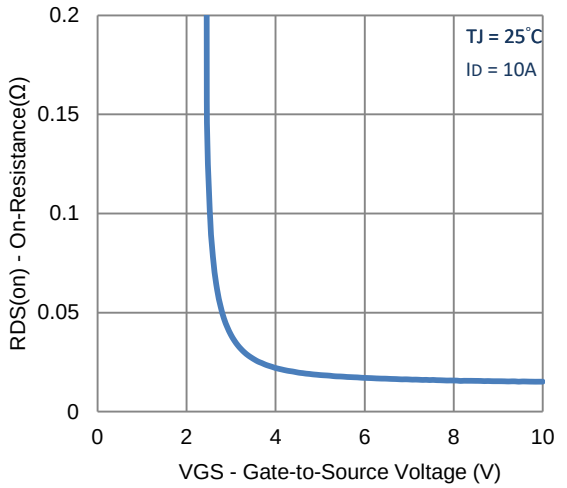
Typical Electrical Characteristics - N-channel



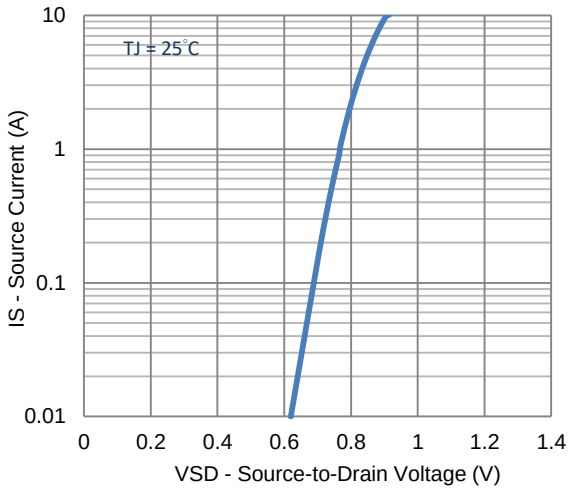
1. On-Resistance vs. Drain Current



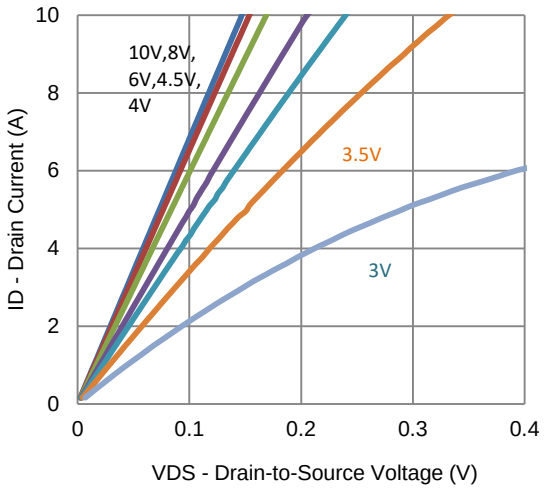
2. Transfer Characteristics



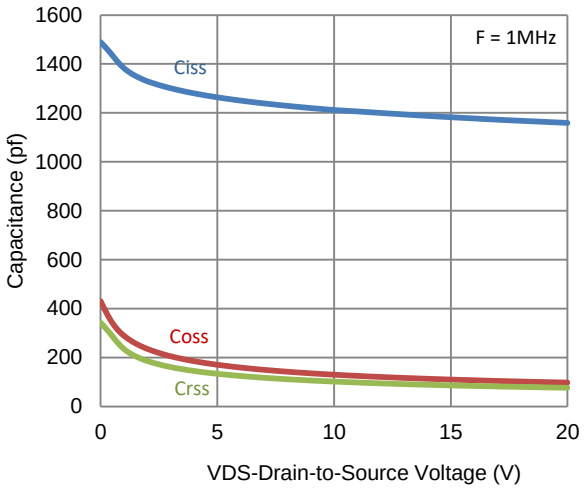
3. On-Resistance vs. Gate-to-Source Voltage



4. Drain-to-Source Forward Voltage

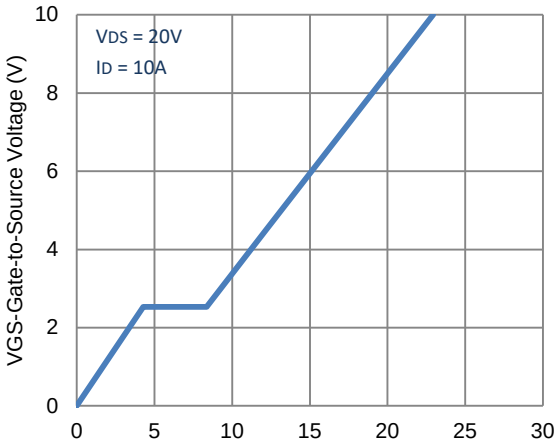


5. Output Characteristics

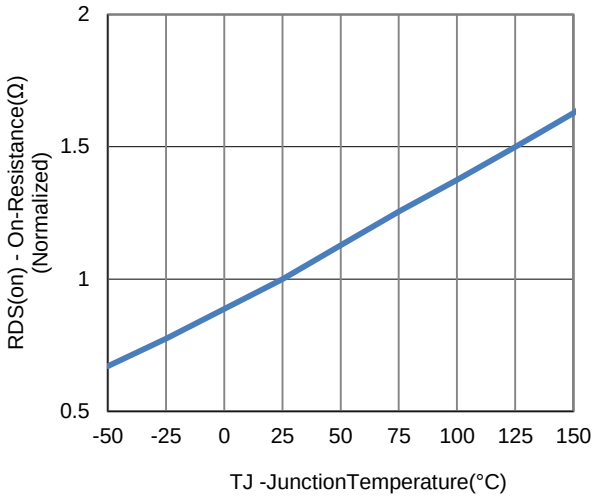


6. Capacitance

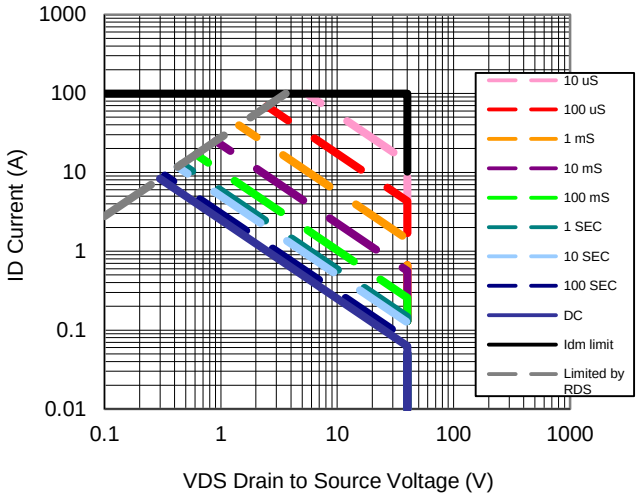
Typical Electrical Characteristics - N-channel



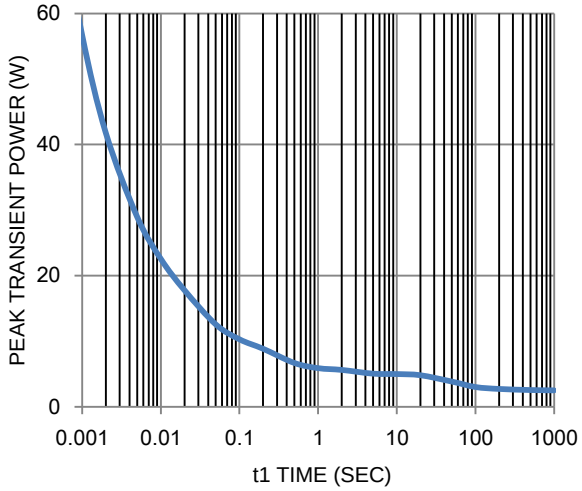
7. Gate Charge



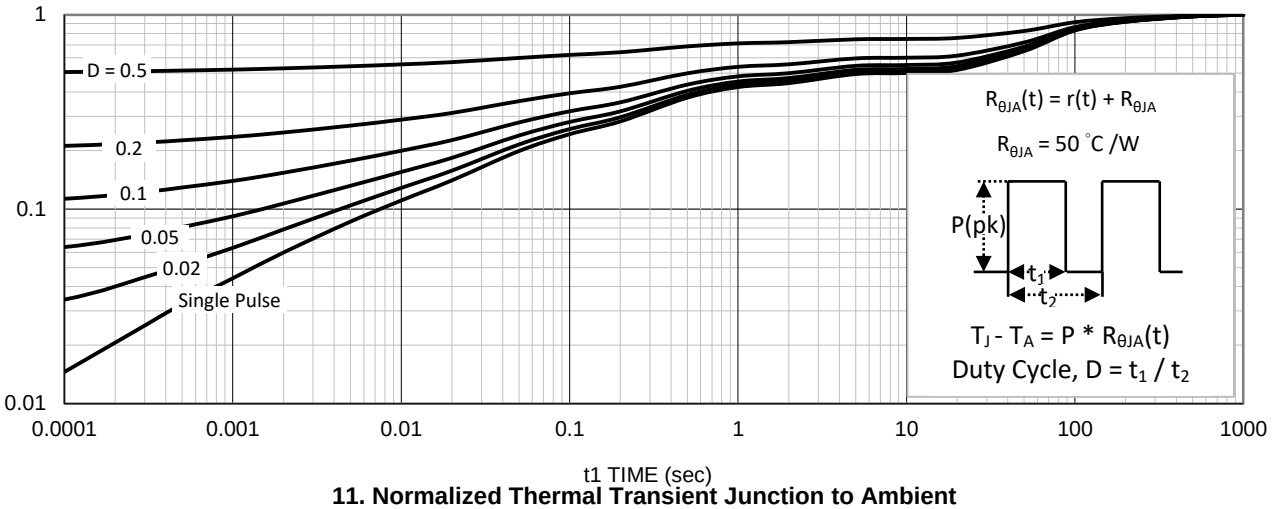
8. Normalized On-Resistance Vs Junction Temperature



9. Safe Operating Area

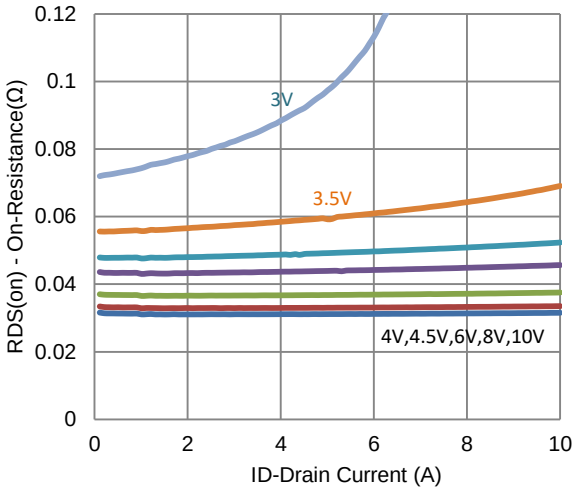


10. Single Pulse Maximum Power Dissipation

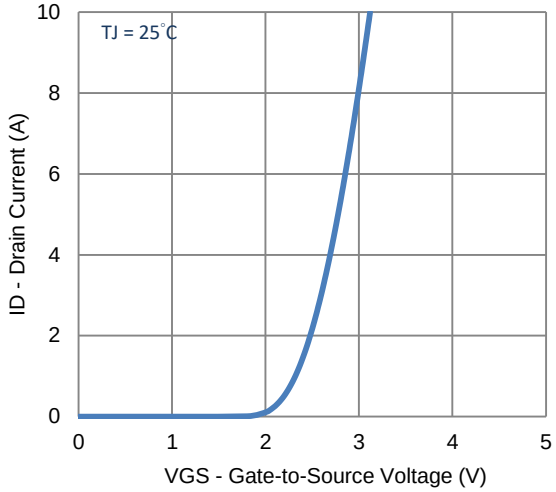


11. Normalized Thermal Transient Junction to Ambient

Typical Electrical Characteristics - P-channel



1. On-Resistance vs. Drain Current



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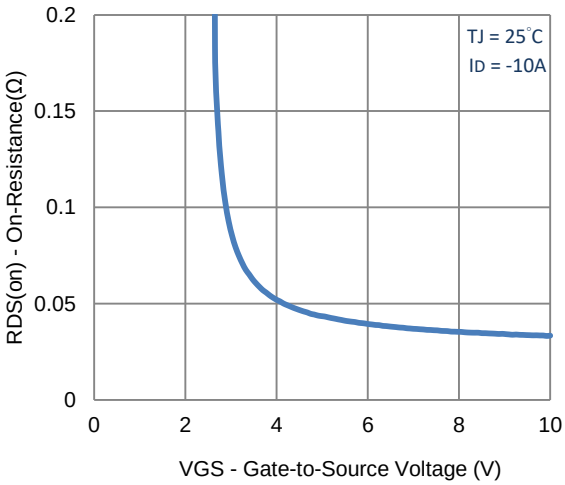
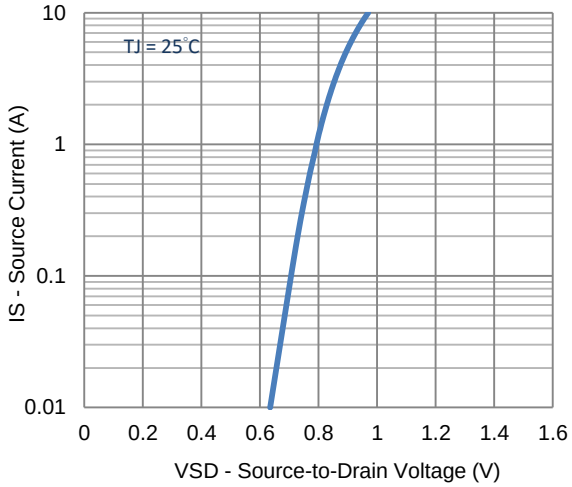
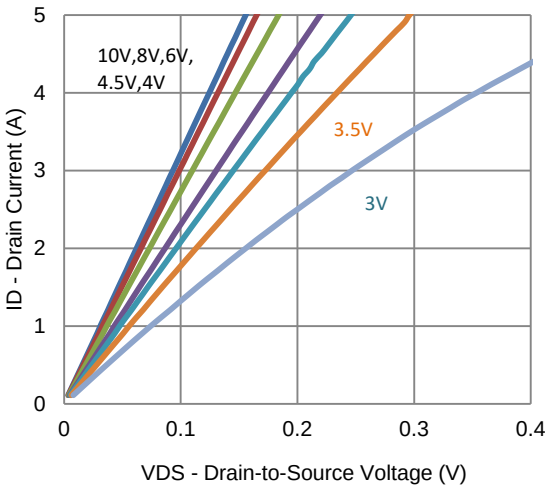


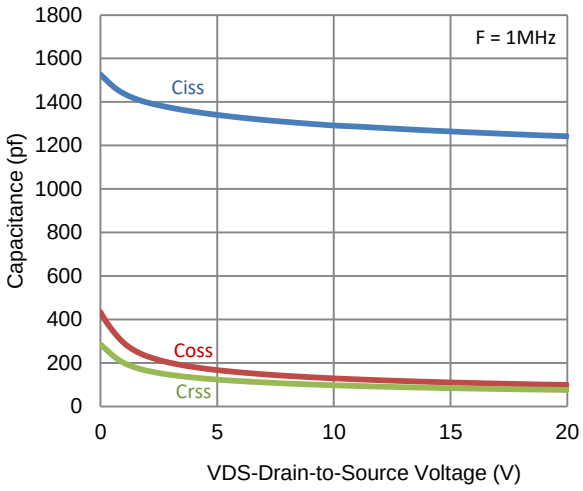
3. On-Resistance vs. Gate-to-Source Voltage



4. Drain-to-Source Forward Voltage



5. Output Characteristics



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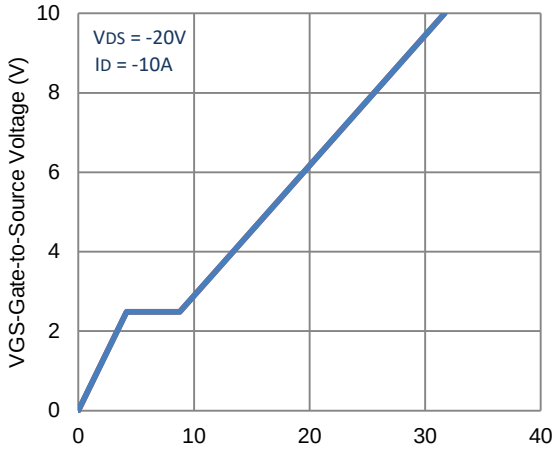
Typical Electrical Characteristics - P-channel



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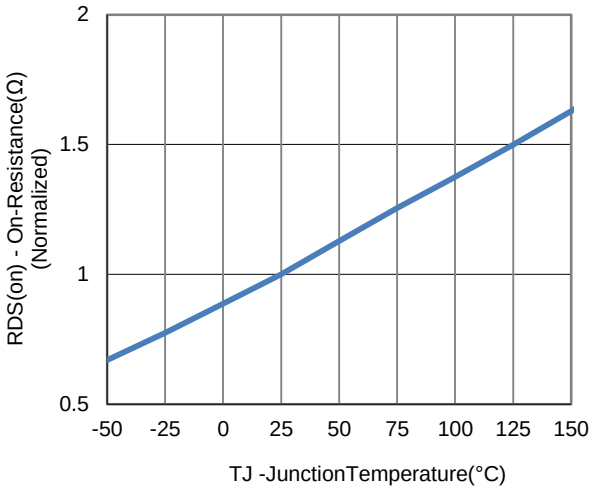

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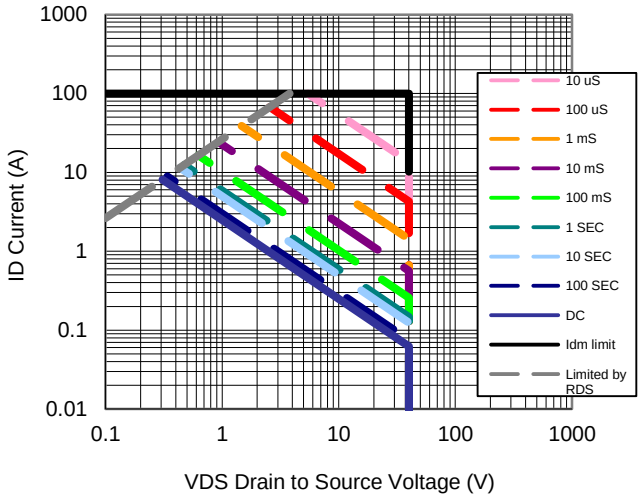

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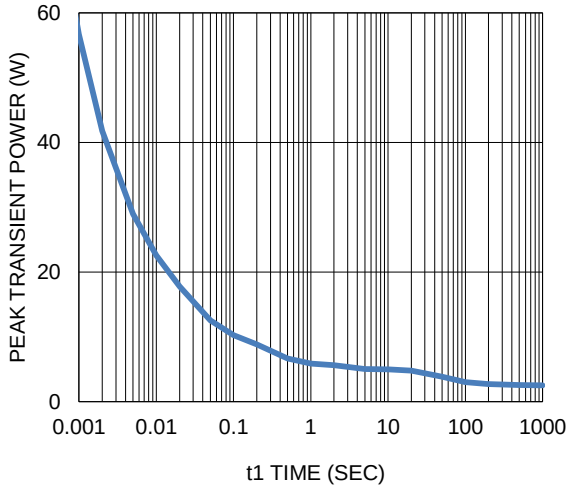

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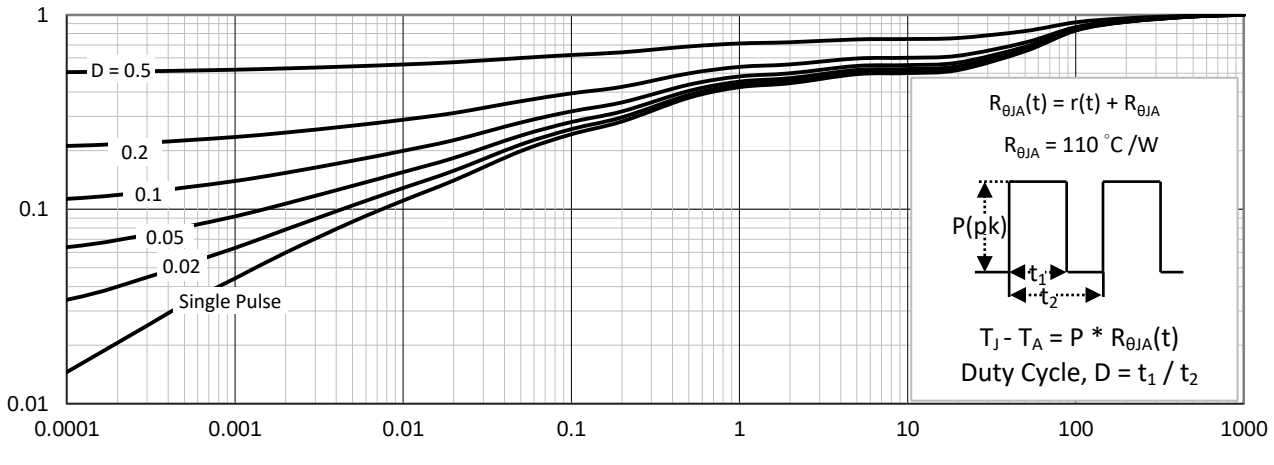
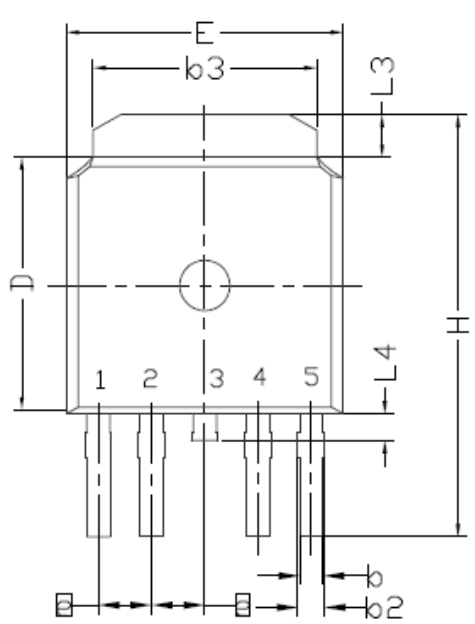
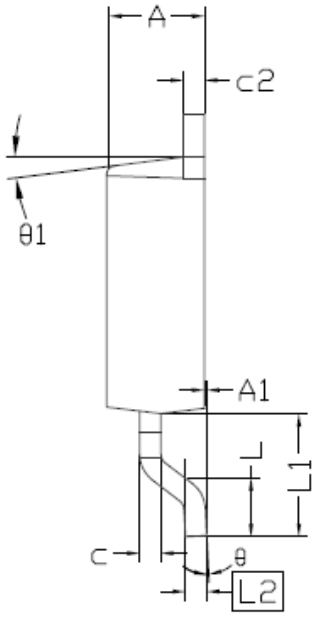
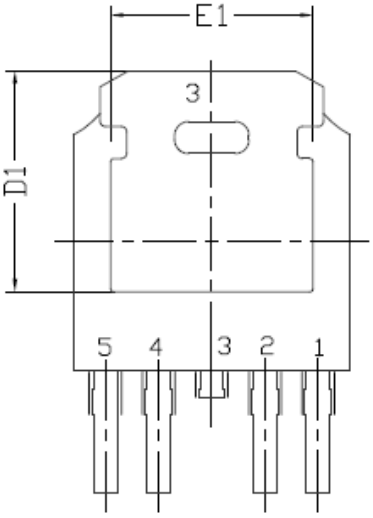


11. Normalized Thermal Transient Junction to Ambient

Package Information







SYMBOL	DIMENSIONAL REQMTS			INCHES REQMTS		
	MIN	NOM	MAX	MIN	NOM	MAX
E	6.35	6.60	6.73	0.250	0.260	0.265
L	1.40	1.52	1.77	0.055	0.060	0.070
L1	2.743 REF			0.108 REF		
L2	0.508 BSC			0.020 BSC		
L3	0.89	1.016	1.27	0.035	0.040	0.050
L4	0.64	--	1.01	0.025	--	0.040
D	6.00	6.10	6.20	0.236	0.240	0.244
H	9.40	10.00	10.40	0.370	0.394	0.409
b	0.508	0.56	0.711	0.020	0.022	0.028
b2	0.584	0.636	0.787	0.023	0.025	0.031
b3	5.21	5.34	5.46	0.205	0.210	0.215
e	1.27 BSC			0.050 BSC		
A	2.20	2.30	2.38	0.087	0.091	0.094
A1	0	--	0.127	0	--	0.005
c	0.457	0.50	0.60	0.018	0.020	0.024
c2	0.457	0.50	0.60	0.018	0.020	0.024
D1	5.21	--	--	0.205	--	--
E1	4.318	--	--	0.170	--	--
θ	0°	--	10°	0°	--	10°
θ1	0°	7°	15°	0°	7°	15°