

## N-Channel Enhancement Mode Power MOSFET

- Features**

$V_{DS} = 30V$ ,

$I_D = 49A$

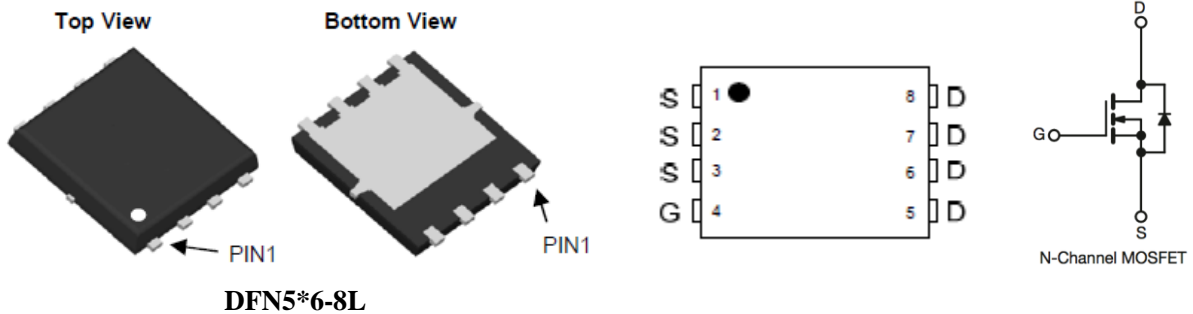
$R_{DS(ON)} @ V_{GS} = 10V$ , Max  $7m\Omega$

$R_{DS(ON)} @ V_{GS} = 4.5V$ , Max  $10.8m\Omega$

- General Description**

- DC/DC conversion
- Battery protection .
- Load switching
- DC/AC inverters

- Pin Configurations**



- Absolute Maximum Ratings @  $T_A=25^\circ C$  unless otherwise noted**

Parameter		Symbol	Ratings	Unit
Drain-Source Voltage		$V_{DSS}$	30	V
Gate-Source Voltage		$V_{GSS}$	$\pm 20$	V
Drain Current (Continuous) *AC	$T_C=25^\circ C$	$I_D$	46.5	A
	$T_C=70^\circ C$		37.2	
Drain Current (Pulse) *B		$I_{DM}$	100	A
Power Dissipation	$T_C=25^\circ C$	$P_D$	25	W
Operating Temperature/ Storage Temperature		$T_J/T_{STG}$	-55~150	$^\circ C$

- Thermal Resistance Ratings**

Parameter		Symbol	Typical	Maximum	Unit
Maximum Junction-to-Ambient	$t \leq 10 s$	$R_{thJA}$	30	37	$^\circ C/W$
Maximum Junction-to-Case (Drain)	Steady State	$R_{thJC}$	4	5	

**● Electrical Characteristics @ $T_A=25^\circ\text{C}$  unless otherwise noted**

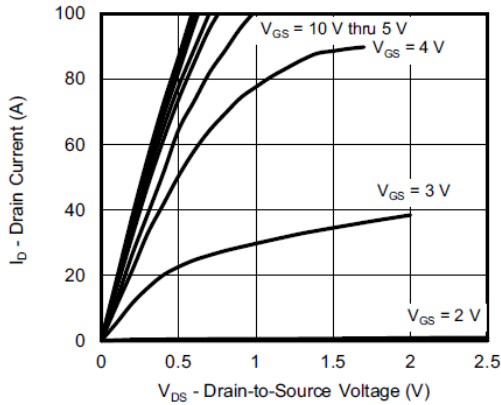
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>Static</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	30	--	--	V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = 30V, V_{GS} = 0V$	--	--	1	$\mu A$
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{GS} = V_{DS}, I_{DS} = 250\mu A$	1	--	2.5	V
Gate Leakage Current	$I_{GSS}$	$V_{GS} = \pm 20V, V_{DS} = 0V$	--	--	$\pm 100$	nA
Drain-Source On-state Resistance	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 20A$	--	--	7	m $\Omega$
	$R_{DS(on)}$	$V_{GS} = 4.5V, I_D = 20A$	--	--	10.8	m $\Omega$
Diode Forward Voltage	$V_{SD}$	$I_{SD} = 1A, V_{GS} = 0V$	--	--	1.2	V
Diode Forward Current *AC	$I_S$	$T_C = 25^\circ\text{C}$	--	--	35	A
<b>Switching</b>						
Total Gate Charge	$Q_g$	$V_{GS} = 10V, V_{DS} = 15V, I_D = 10A$	--	16.8	--	nC
Gate-Source Charge	$Q_{gs}$		--	2.1	--	nC
Gate-Drain Charge	$Q_{gd}$		--	2.8	--	nC
Turn-on Delay Time	$t_{d(on)}$	$V_{DD} = 15V, R_L = 1.5\Omega$ $I_D \cong 10A, V_{GEN} = 10V, R_g = 1\Omega$	--	7	--	ns
Turn-on Rise Time	$t_r$		--	28	--	ns
Turn-off Delay Time	$t_{d(off)}$		--	14	--	ns
Turn-Off Fall Time	$t_f$		--	8	--	ns
<b>Dynamic</b>						
Input Capacitance	$C_{iss}$	$V_{DS} = 15V, V_{GS} = 0V, f = 1.0\text{MHz}$	--	947	--	pF
Output Capacitance	$C_{oss}$		--	157	--	pF
Reverse Transfer Capacitance	$C_{rss}$		--	10	--	pF

A: The value of  $R_{\theta JA}$  is measured with the device mounted on 1in<sup>2</sup> FR-4 board with 2oz. Copper, in a still air environment with  $T_A=25^\circ\text{C}$ . The value in any given application depends on the user's specific board design.

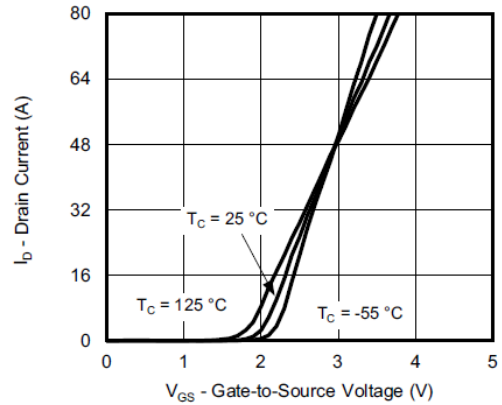
B: Repetitive rating, pulse width limited by junction temperature.

C: The current rating is based on the  $\leq 10\text{s}$  junction to ambient thermal resistance rating.

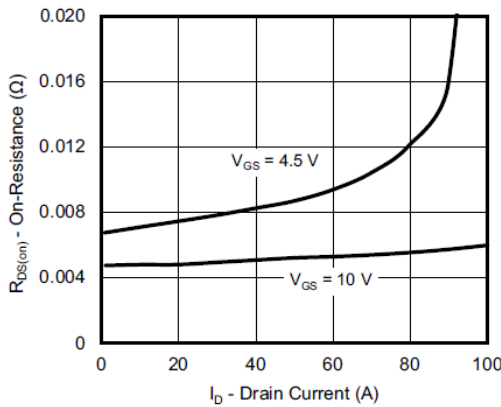
● Typical Performance Characteristics (( $T_J = 25\text{ }^\circ\text{C}$ , unless otherwise noted))



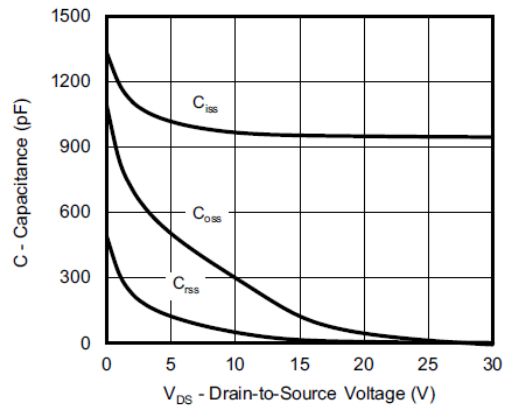
Output Characteristics



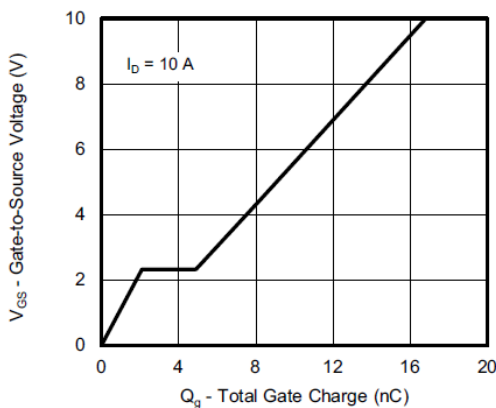
Transfer Characteristics



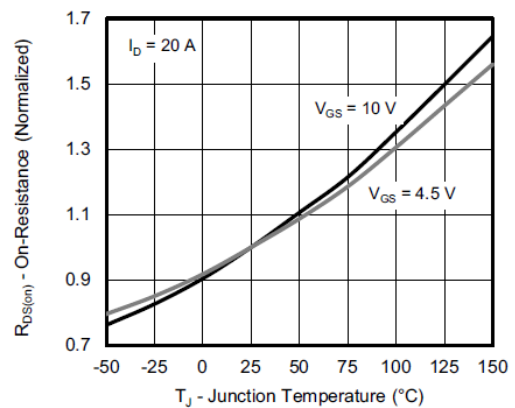
On-Resistance vs. Drain Current



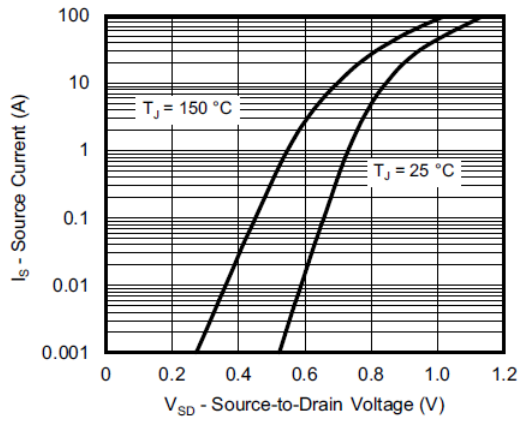
Capacitance



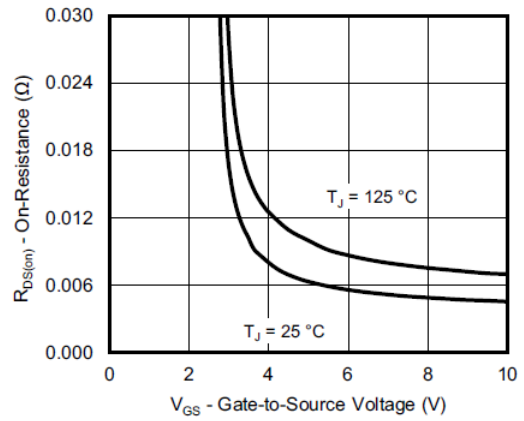
Gate Charge



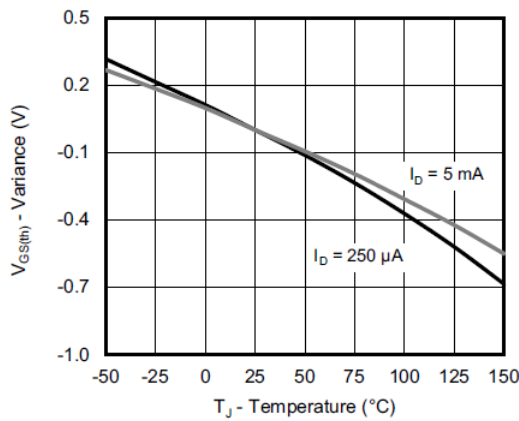
On-Resistance vs. Junction Temperature



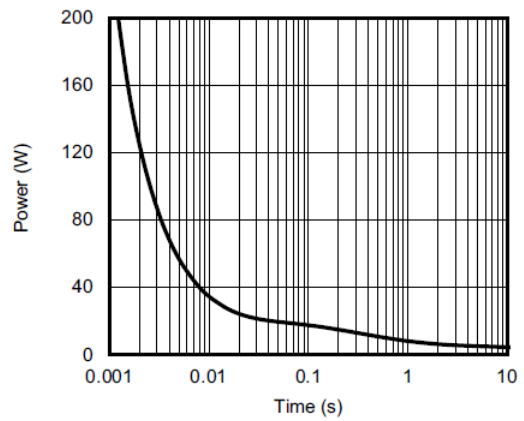
Source-Drain Diode Forward Voltage



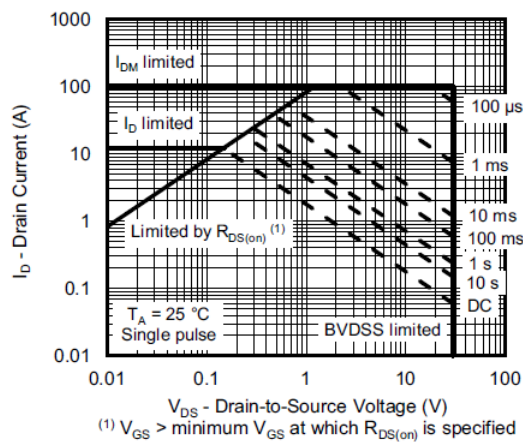
On-Resistance vs. Gate-to-Source Voltage



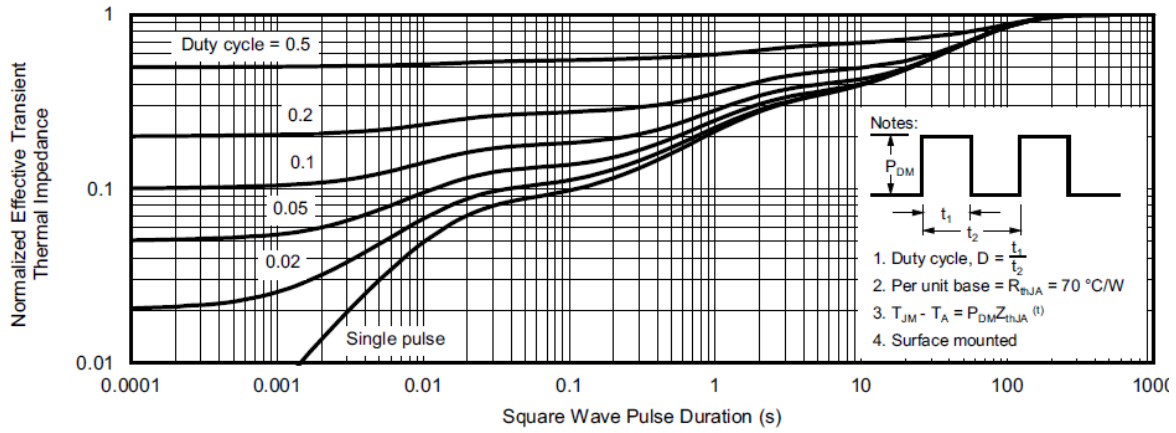
Threshold Voltage



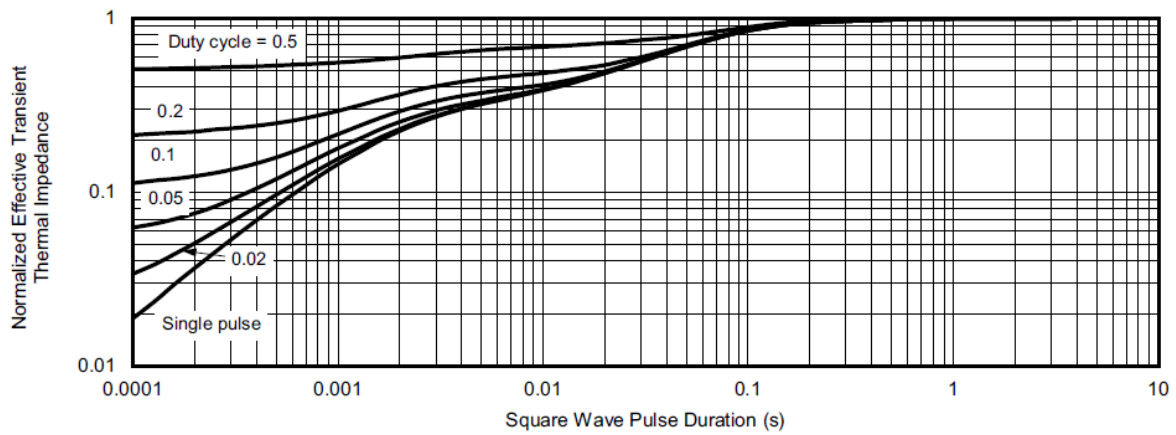
Single Pulse Power, Junction-to-Ambient



Safe Operating Area

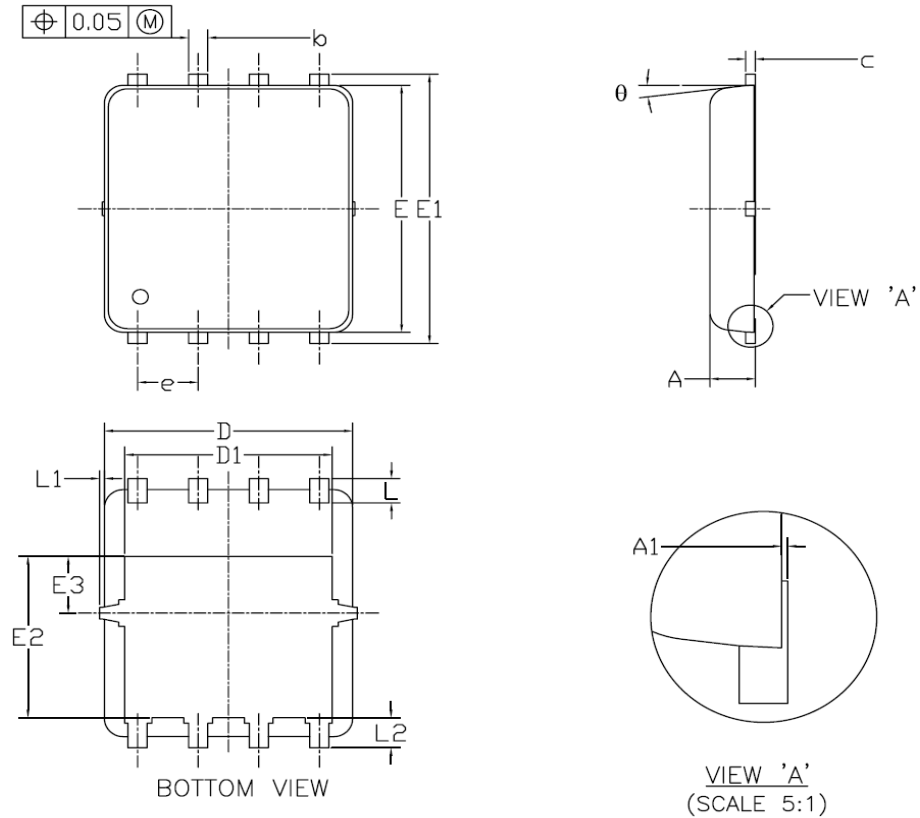


Normalized Thermal Transient Impedance, Junction-to-Ambient

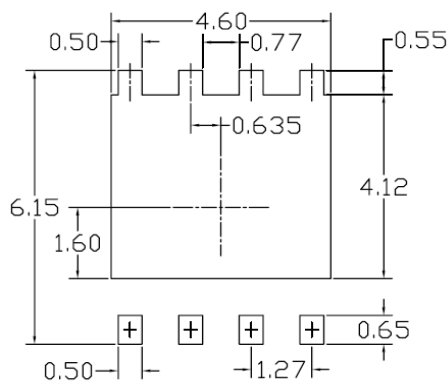


Normalized Thermal Transient Impedance, Junction-to-Case

● Package Information



RECOMMENDED LAND PATTERN



UNIT: mm

NOTE

1. PACKAGE BODY SIZES EXCLUDE MOLD FLASH AND GATE BURRS.  
MOLD FLASH AT THE NON-LEAD SIDES SHOULD BE LESS THAN 6 MILS EACH.
2. CONTROLLING DIMENSION IS MILLIMETER.  
CONVERTED INCH DIMENSIONS ARE NOT NECESSARILY EXACT.

SYMBOLS	DIMENSIONS IN MILLIMETERS			DIMENSIONS IN INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.85	0.95	1.00	0.033	0.037	0.039
A1	0.00	—	0.05	0.000	—	0.002
b	0.30	0.40	0.50	0.012	0.016	0.020
c	0.15	0.20	0.25	0.006	0.008	0.010
D	5.20 BSC			0.205 BSC		
D1	4.35 BSC			0.171 BSC		
E	5.55 BSC			0.219 BSC		
E1	6.05 BSC			0.238 BSC		
E2	3.625 BSC			0.143 BSC		
E3	1.275 BSC			0.050 BSC		
e	1.27 BSC			0.050 BSC		
L	0.45	0.55	0.65	0.018	0.022	0.026
L1	0	—	0.15	0	—	0.006
L2	0.68 REF			0.027 REF		
$\theta$	0°	—	10°	0°	—	10°