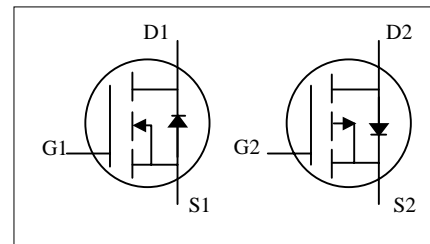
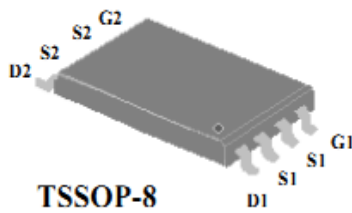


N- and P-Channel 60-V (D-S) MOSFET

- ▼ Simple Drive Requirement
- ▼ Lower Gate Charge
- ▼ Fast Switching Performance
- ▼ RoHS Compliant & Halogen-Free

N-CH	BV_{DSS}	30V
	$R_{DS(ON)}$	22m Ω
	I_D	6.2A
P-CH	BV_{DSS}	-30V
	$R_{DS(ON)}$	45m Ω
	I_D	-5.0A



Absolute Maximum Ratings

Symbol	Parameter	Rating		Units
		N-channel	P-channel	
V_{DS}	Drain-Source Voltage	30	-30	V
V_{GS}	Gate-Source Voltage	± 20	± 20	V
$I_D@T_A=25^\circ C$	Continuous Drain Current ³	6.2	-5.0	A
$I_D@T_A=70^\circ C$	Continuous Drain Current ³	5.0	-4.0	A
I_{DM}	Pulsed Drain Current ¹	20	-18	A
$P_D@T_A=25^\circ C$	Total Power Dissipation	1.35		W
T_{STG}	Storage Temperature Range	-55 to 150		$^\circ C$
T_J	Operating Junction Temperature Range	-55 to 150		$^\circ C$

Thermal Data

Symbol	Parameter	Value	Unit
R_{thj-a}	Maximum Thermal Resistance, Junction-ambient ³	90	$^\circ C/W$

N-CH Electrical Characteristics @ $T_j=25^\circ\text{C}$ (unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	30	-	-	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance ²	$V_{GS}=10V, I_D=6A$	-	23	-	m Ω
		$V_{GS}=4.5V, I_D=4A$	-	30	-	m Ω
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	1	-	3	V
g_{fs}	Forward Transconductance	$V_{DS}=10V, I_D=6A$	-	14	-	S
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=24V, V_{GS}=0V$	-	-	1	μA
I_{GSS}	Gate-Source Leakage	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 100	nA
Q_g	Total Gate Charge	$I_D=6A$	-	7	11	nC
Q_{gs}	Gate-Source Charge	$V_{DS}=15V$	-	2	-	nC
Q_{gd}	Gate-Drain ("Miller") Charge	$V_{GS}=4.5V$	-	4	-	nC
$t_{d(on)}$	Turn-on Delay Time	$V_{DS}=15V$	-	6	-	ns
t_r	Rise Time	$I_D=1A$	-	6	-	ns
$t_{d(off)}$	Turn-off Delay Time	$R_G=3.3\Omega$	-	17	-	ns
t_f	Fall Time	$V_{GS}=10V$	-	4	-	ns
C_{iss}	Input Capacitance	$V_{GS}=0V$	-	550	-	pF
C_{oss}	Output Capacitance	$V_{DS}=15V$	-	105	-	pF
C_{rss}	Reverse Transfer Capacitance	$f=1.0\text{MHz}$	-	90	-	pF
R_g	Gate Resistance	$f=1.0\text{MHz}$	-	1.7	-	Ω

Source-Drain Diode

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V_{SD}	Forward On Voltage ²	$I_S=1.2A, V_{GS}=0V$	-	-	1.2	V
t_{rr}	Reverse Recovery Time	$I_S=6A, V_{GS}=0V,$	-	15	-	ns
Q_{rr}	Reverse Recovery Charge	$di/dt=100A/\mu s$	-	7	-	nC

P-CH Electrical Characteristics @ $T_j=25^\circ\text{C}$ (unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=-250\mu A$	-30	-	-	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance ²	$V_{GS}=-10V, I_D=-5A$	-	45	-	m Ω
		$V_{GS}=-4.5V, I_D=-3A$	-	66	-	m Ω
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=-250\mu A$	-1	-	-3	V
g_{fs}	Forward Transconductance	$V_{DS}=-10V, I_D=-5A$	-	18	-	S
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=-24V, V_{GS}=0V$	-	-	-1	μA
I_{GSS}	Gate-Source Leakage	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	+100	nA
Q_g	Total Gate Charge	$I_D=-5A$	-	14.4	23	nC
Q_{gs}	Gate-Source Charge	$V_{DS}=-15V$	-	5.5	-	nC
Q_{gd}	Gate-Drain ("Miller") Charge	$V_{GS}=-4.5V$	-	5	-	nC
$t_{d(on)}$	Turn-on Delay Time	$V_{DS}=-15V$	-	7	-	ns
t_r	Rise Time	$I_D=-1A$	-	6.5	-	ns
$t_{d(off)}$	Turn-off Delay Time	$R_G=3.3\Omega$	-	36	-	ns
t_f	Fall Time	$V_{GS}=-10V$	-	28	-	ns
C_{iss}	Input Capacitance	$V_{GS}=0V$	-	960	-	pF
C_{oss}	Output Capacitance	$V_{DS}=-15V$	-	190	-	pF
C_{rss}	Reverse Transfer Capacitance	$f=1.0\text{MHz}$	-	170	-	pF
R_g	Gate Resistance	$f=1.0\text{MHz}$	-	6	-	Ω

Source-Drain Diode

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V_{SD}	Forward On Voltage ²	$I_S=-1.2A, V_{GS}=0V$	-	-	-1.2	V
t_{rr}	Reverse Recovery Time	$I_S=-5A, V_{GS}=0V,$	-	19	-	ns
Q_{rr}	Reverse Recovery Charge	$dI/dt=100A/\mu s$	-	9	-	nC

Notes:

1. Pulse width limited by Max. junction temperature.

2. Pulse test

3. Surface mounted on 1 in² copper pad of FR4 board, $t \leq 10\text{sec}$; $208^\circ\text{C}/W$ when mounted on min. copper pad.

N-Channel

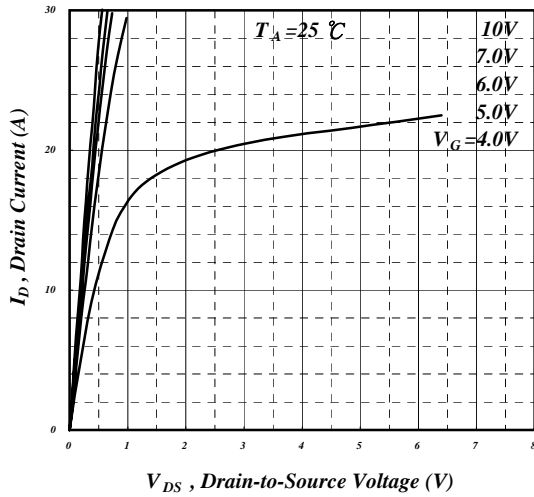


Fig 1. Typical Output Characteristics

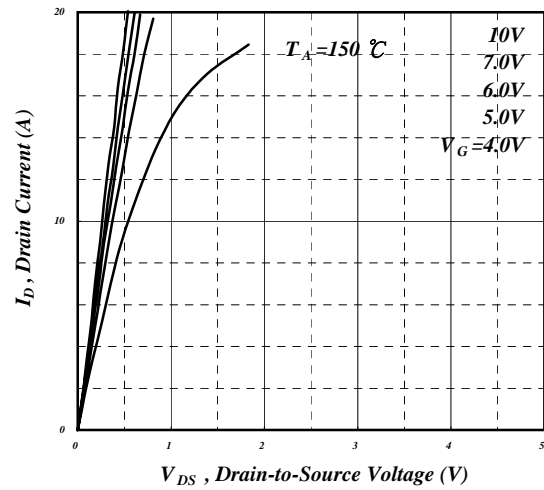


Fig 2. Typical Output Characteristics

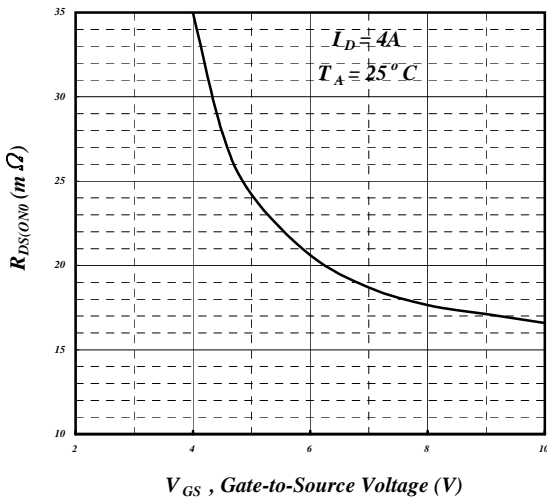


Fig 3. On-Resistance v.s. Gate Voltage

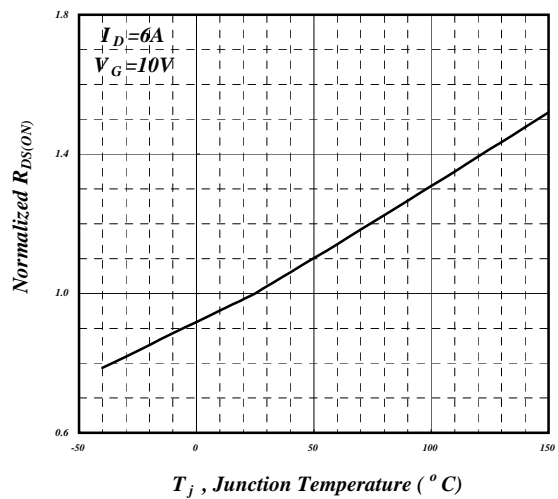


Fig 4. Normalized On-Resistance v.s. Junction Temperature

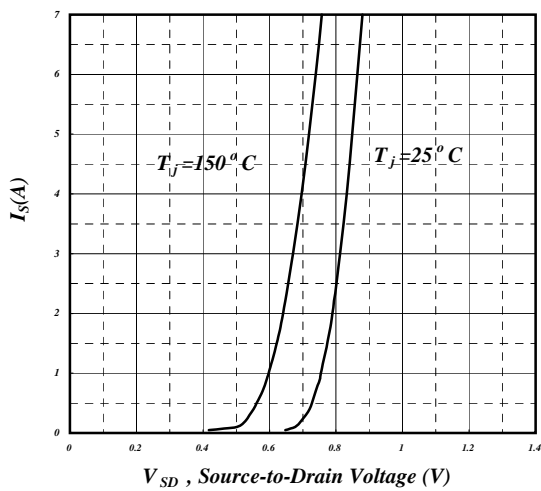


Fig 5. Forward Characteristic of Reverse Diode

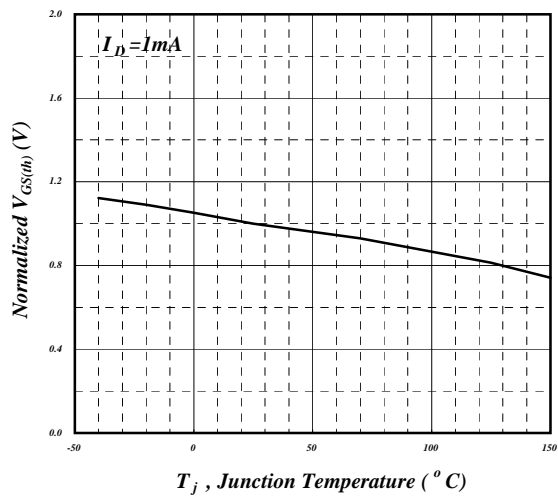


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

N-Channel

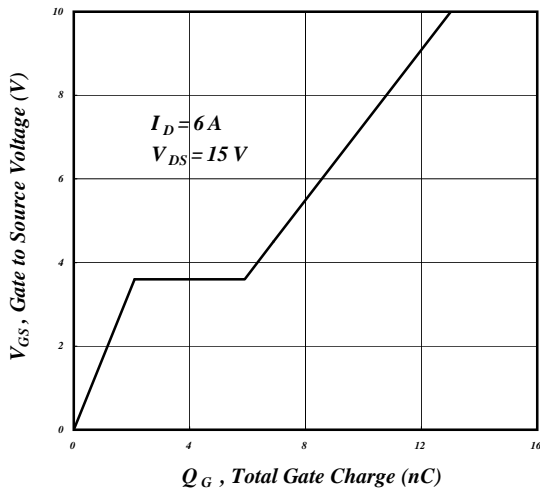


Fig 7. Gate Charge Characteristics

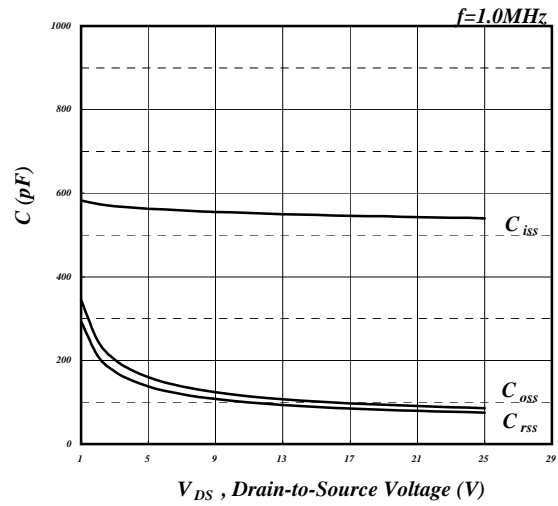


Fig 8. Typical Capacitance Characteristics

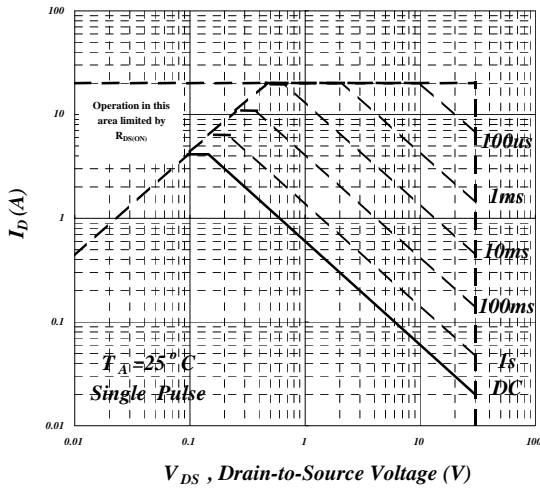


Fig 9. Maximum Safe Operating Area

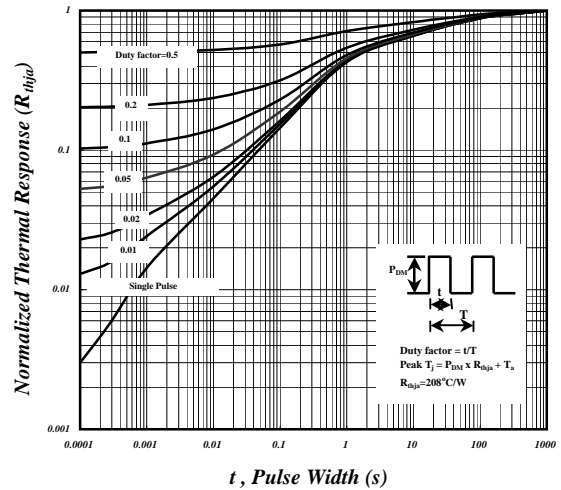


Fig 10. Effective Transient Thermal Impedance

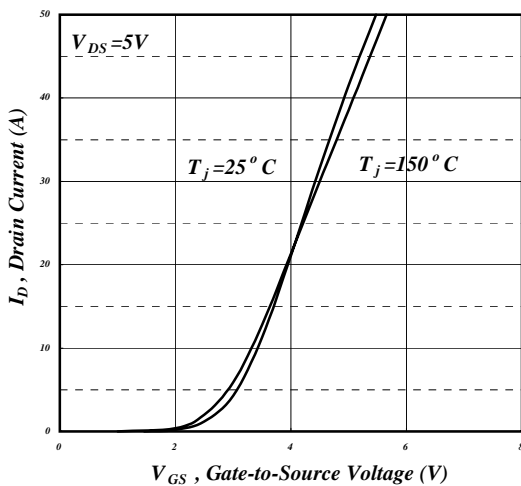


Fig 11. Transfer Characteristics

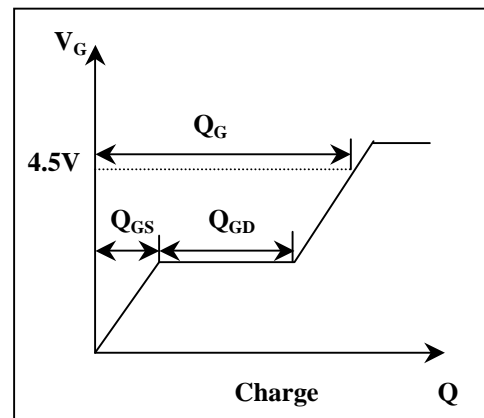


Fig 12. Gate Charge Waveform

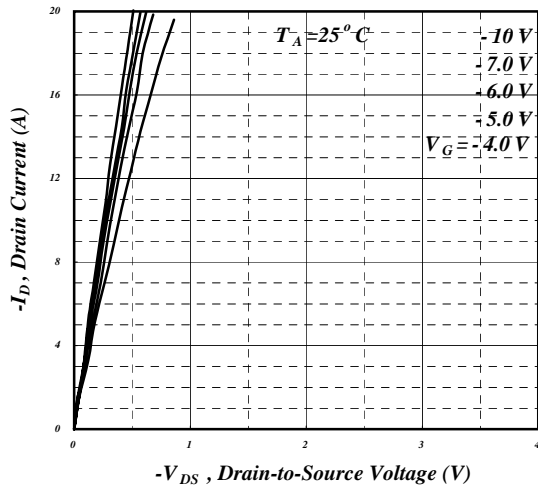


Fig 1. Typical Output Characteristics

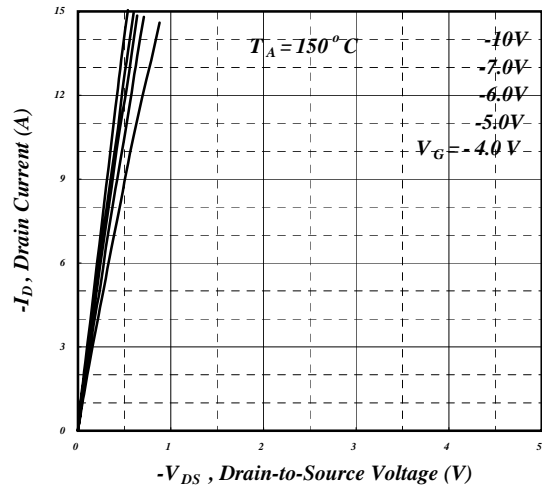


Fig 2. Typical Output Characteristics

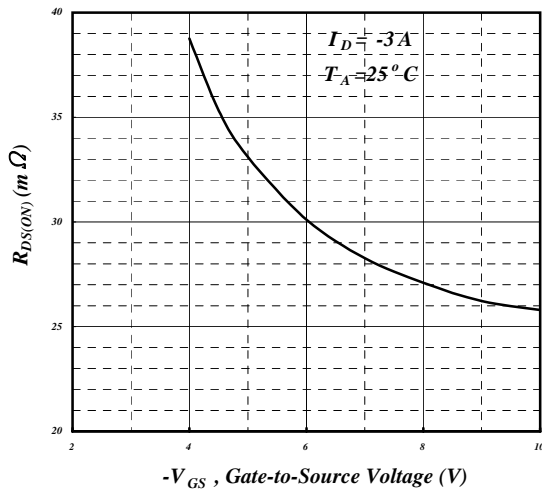


Fig 3. On-Resistance v.s. Gate Voltage

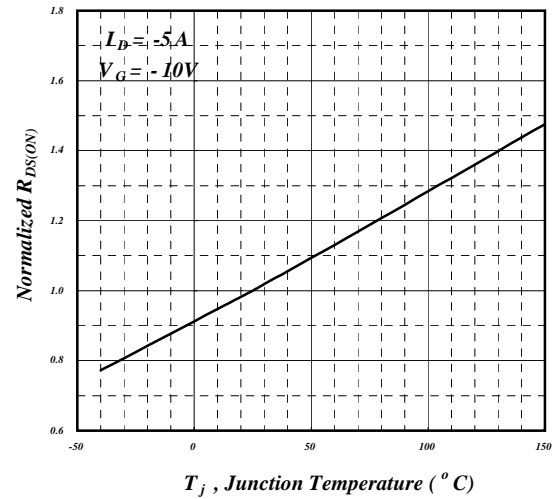


Fig 4. Normalized On-Resistance v.s. Junction Temperature

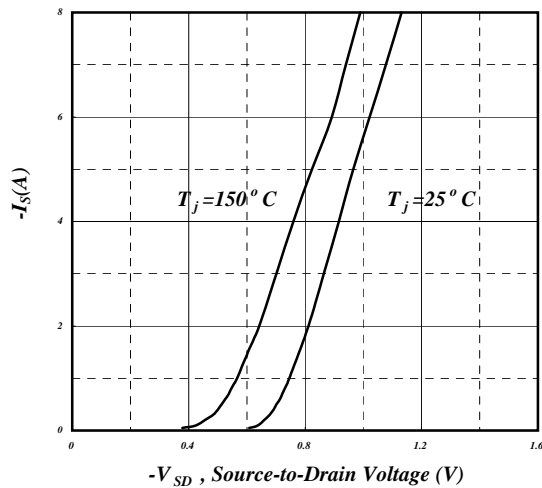


Fig 5. Forward Characteristic of Reverse Diode

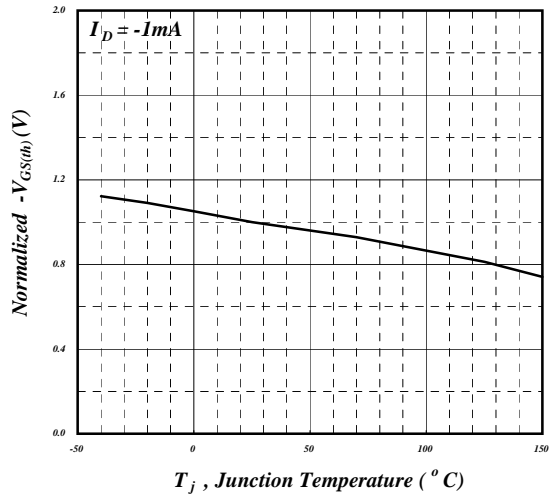


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

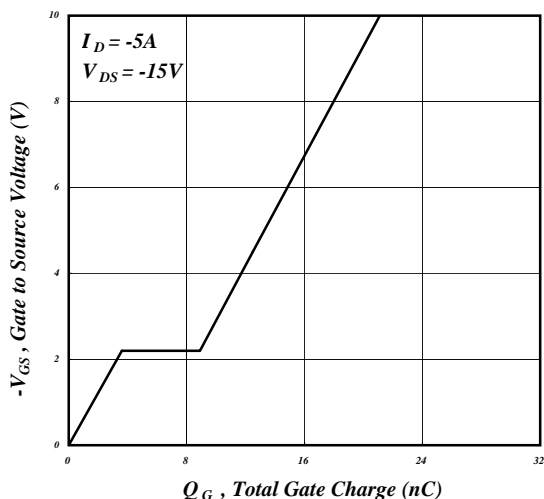


Fig 7. Gate Charge Characteristics

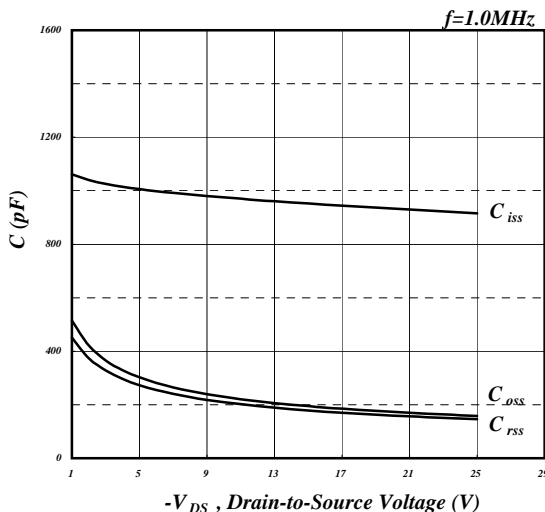


Fig 8. Typical Capacitance Characteristics

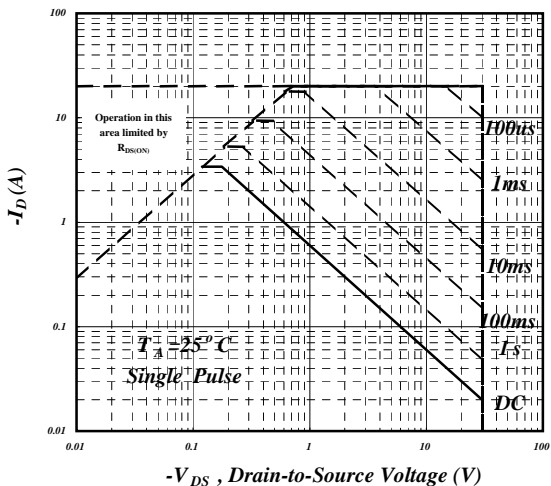


Fig 9. Maximum Safe Operating Area

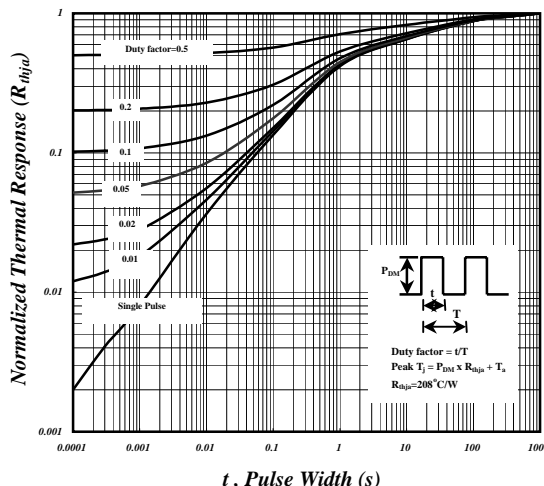


Fig 10. Effective Transient Thermal Impedance

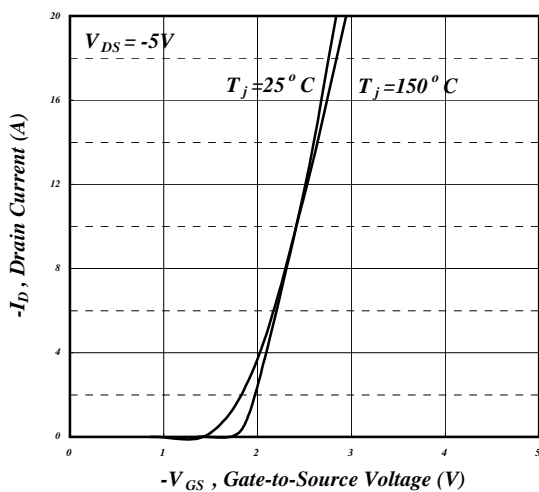


Fig 11. Transfer Characteristics

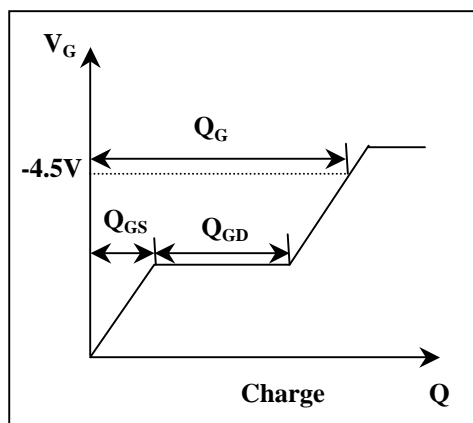
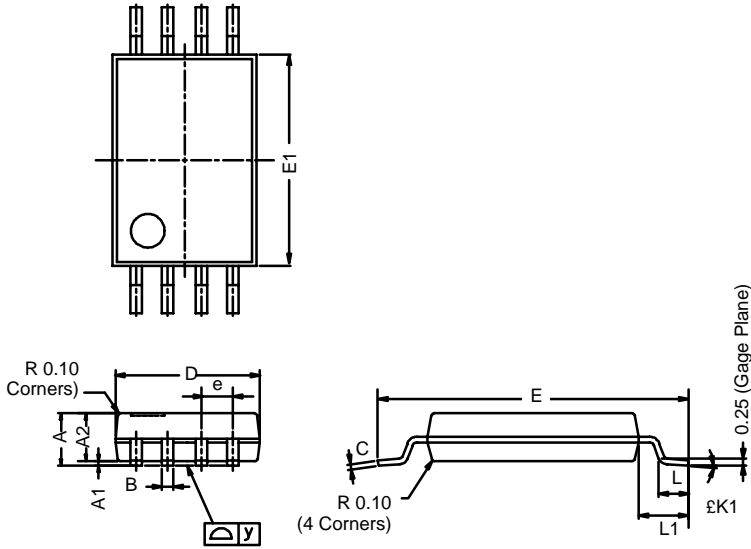


Fig 12. Gate Charge Waveform

TSSOP: 8-LEAD

JEDEC Part Number: MO-153



Dim	MILLIMETERS		
	Min	Nom	Max
A	–	–	1.20
A ₁	0.05	0.10	0.15
A ₂	0.80	1.00	1.05
B	0.19	0.28	0.30
C	–	0.127	–
D	2.90	3.00	3.10
E	6.20	6.40	6.60
E ₁	4.30	4.40	4.50
e	–	0.65	–
L	0.45	0.60	0.75
L ₁	0.90	1.00	1.10
Y	–	–	0.10
£K1	0°	3°	6°

ECN: S-03946—Rev. G, 09-Jul-01
DWG: 5844

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