

Features

- Trench MV MOSFET Technology
- Moisture Sensitivity Level 1
- Halogen Free. "Green" Device (Note 1)
- Epoxy Meets UL 94 V-0 Flammability Rating
- Lead Free Finish/RoHS Compliant ("P" Suffix Designates RoHS Compliant. See Ordering Information)

Maximum Ratings

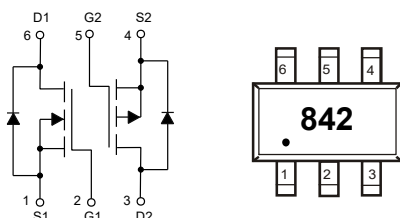
- Operating Junction Temperature Range : -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance: 320°C/W Junction to Ambient(Notes2)

Parameter	Symbol	Rating	Unit
Total Power Dissipation(Notes 4)	P_D	390	mW
N-Channel MOSFET			
Drain-Source Voltage	V_{DS}	60	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current	I_D	$T_A=25^\circ\text{C}$	115
		$T_A=100^\circ\text{C}$	72
Pulsed Drain Current (Note 3)	I_{DM}	460	mA
P-Channel MOSFET			
Drain-Source Voltage	V_{DS}	-50	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current	I_D	$T_A=25^\circ\text{C}$	-130
		$T_A=100^\circ\text{C}$	-82
Pulsed Drain Current (Note 3)	I_{DM}	-520	mA

Note:

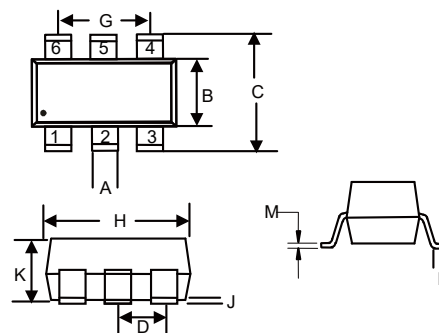
1. Halogen free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
2. The value of $R_{\theta JA}$ is measured with the device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with $T_A=25^\circ\text{C}$.
3. Repetitive rating; pulse width limited by max. junction temperature.
4. P_D is based on max. junction temperature, using junction-ambient thermal resistance.

Internal Structure and Marking Code



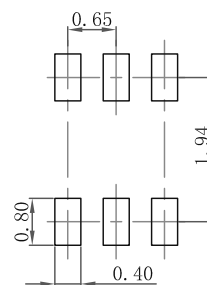
Dual N&P-Channel MOSFET

SOT-363



DIM	DIMENSIONS				NOTE
	INCHES		MM		
	MIN	MAX	MIN	MAX	
A	0.006	0.014	0.15	0.35	
B	0.045	0.053	1.15	1.35	
C	0.079	0.096	2.00	2.45	
D		0.026	0.65		TYP.
G	0.047	0.055	1.20	1.40	
H	0.071	0.087	1.80	2.20	
J	-----	0.004	-----	0.10	
K	0.031	0.043	0.80	1.10	
L	0.010	0.018	0.26	0.46	
M	0.003	0.006	0.08	0.15	

Suggested Solder Pad Layout



N-Channel Electrical Characteristics @ 25°C (Unless Otherwise Specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=10\mu A$	60			V
Gate-Source Leakage Current	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 20V$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=60V, V_{GS}=0V$			80	nA
		$V_{DS}=60V, V_{GS}=0V, T_J=125^\circ C$			1	μA
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1.0	1.6	2.5	V
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=500mA$		1.2	2	Ω
		$V_{GS}=5V, I_D=50mA$		1.3	3	
Forward Transconductance	g_{fs}	$V_{DS}=10V, I_D=200mA$		300		mS
Gate Resistance	R_g	f=1 MHz, Open drain		4		Ω
Diode Characteristics						
Continuous Body Diode Current	I_S				115	mA
Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_S=115mA$			1.5	V
Reverse Recovery Time	t_{rr}	$I_F=0.5A, dI_F/dt=100A/\mu s$		9.4		ns
Reverse Recovery Charge	Q_{rr}			3.1		nC
Dynamic Characteristics						
Input Capacitance	C_{iss}	$V_{DS}=25V, V_{GS}=0V, f=1MHz$		25.2		pF
Output Capacitance	C_{oss}			3.5		
Reverse Transfer Capacitance	C_{rss}			2.2		
Total Gate Charge	Q_g	$V_{DS}=25V, V_{GS}=10V, I_D=0.5A$		1.1		nC
Gate-Source Charge	Q_{gs}			0.2		
Gate-Drain Charge	Q_{gd}			0.25		
Turn-On Delay Time	$t_{d(on)}$	$V_{DD}=25V, V_{GS}=10V, R_G=25\Omega, I_{DS}=0.5A$		2.3		ns
Turn-On Rise Time	t_r			2.7		
Turn-Off Delay Time	$t_{d(off)}$			6.3		
Turn-Off Fall Time	t_f			3		

P-Channel Electrical Characteristics @ 25°C (Unless Otherwise Specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=-250\mu A$	-50			V
Gate-Source Leakage Current	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 20V$			± 5	μA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=-50V, V_{GS}=0V$			-1	μA
		$V_{DS}=-25V, V_{GS}=0V$			-0.1	
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-0.9	-1.4	-2.0	V
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=-10V, I_D=-0.1A$		2.8	8	Ω
		$V_{GS}=-5V, I_D=-0.1A$		3.2	10	
Forward Transconductance	g_{fs}	$V_{DS}=-5V, I_D=-0.13A$		220		mS
Gate Resistance	R_g	f=1 MHz, Open drain		25		Ω
Diode Characteristics						
Continuous Body Diode Current	I_S				-0.13	A
Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_S=-0.13A$			-2.2	V
Reverse Recovery Time	t_{rr}	$I_F=-0.15A, di/dt=100A/\mu s$		10		ns
Reverse Recovery Charge	Q_{rr}			4		nC
Dynamic Characteristics						
Input Capacitance	C_{iss}	$V_{DS}=-25V, V_{GS}=0V, f=1MHz$		27		μF
Output Capacitance	C_{oss}			6		
Reverse Transfer Capacitance	C_{rss}			4		
Total Gate Charge	Q_g	$V_{DS}=-25V, V_{GS}=-10V, I_D=-0.15A$		2.4		nC
Gate-Source Charge	Q_{gs}			0.4		
Gate-Drain Charge	Q_{gd}			0.4		
Turn-On Delay Time	$t_{d(on)}$	$V_{DS}=-30V, V_{GS}=-10V, R_G=2.5\Omega, I_D=-0.15A$		9		ns
Turn-On Rise Time	t_r			4		
Turn-Off Delay Time	$t_{d(off)}$			46		
Turn-Off Fall Time	t_f			24		

Curve Characteristics(N-Channel)

Fig.1 - Typical Output Characteristics

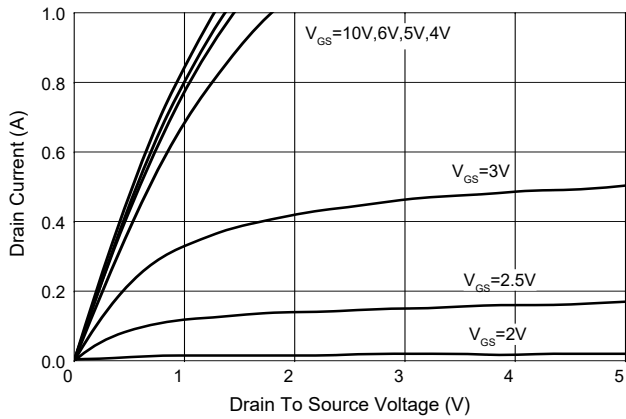


Fig.2 - Transfer Characteristic

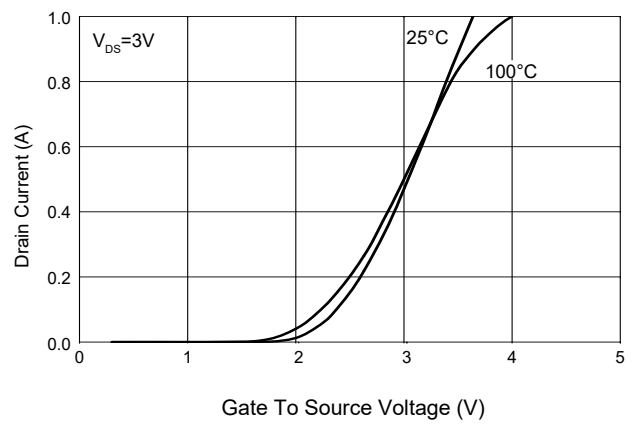


Fig.3 - $R_{DS(ON)}$ - V_{GS}

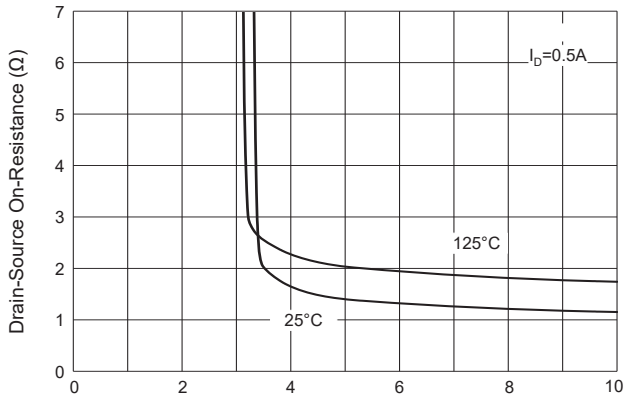


Fig.4 - $R_{DS(ON)}$ - I_D

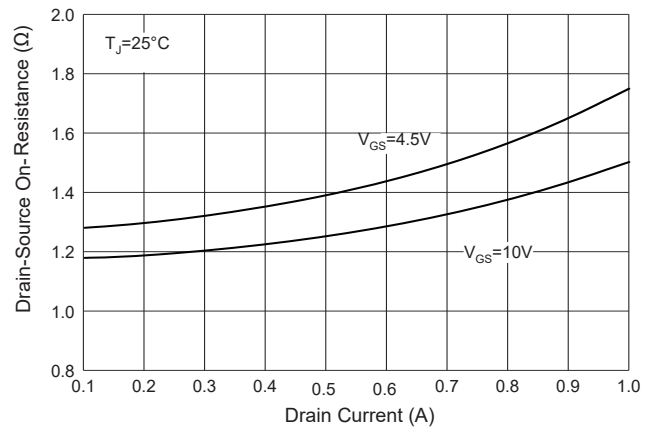


Fig.5 - Capacitance Characteristics

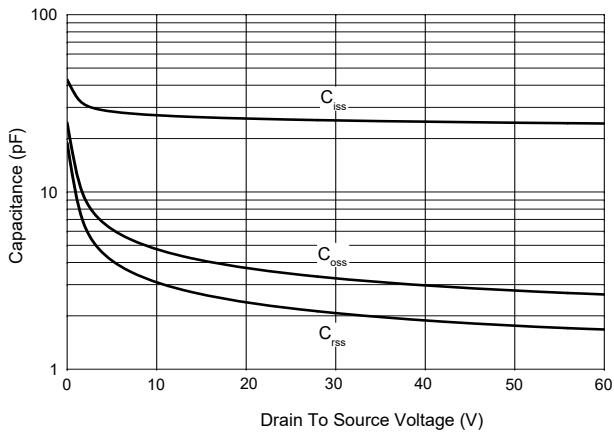
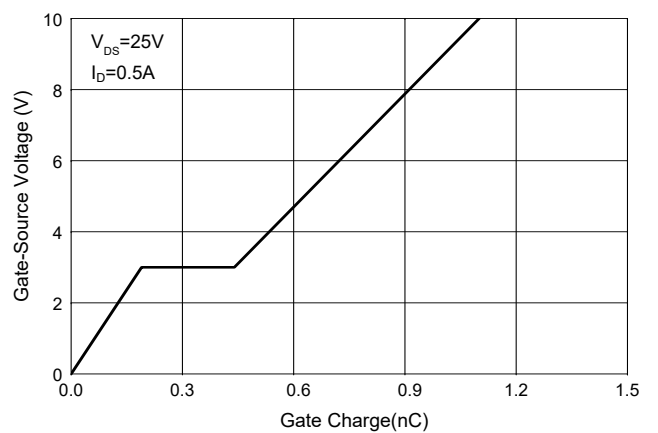


Fig.6 - Gate Charge



Curve Characteristics(N-Channel)

Fig.7 - Normalized Threshold Voltage

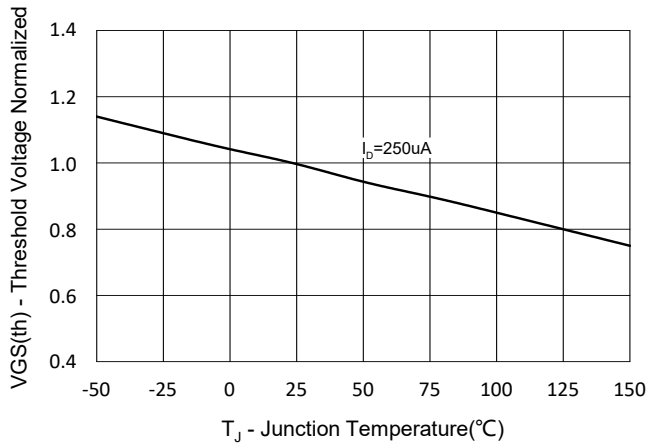


Fig.8 - Normalized On Resistance Characteristics

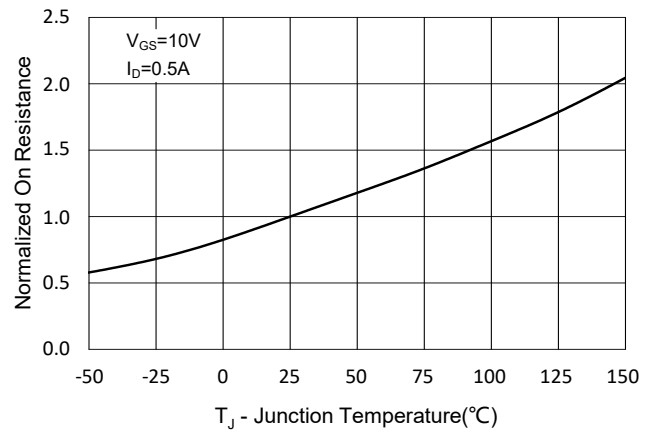


Fig.9 - I_S - V_{SD}

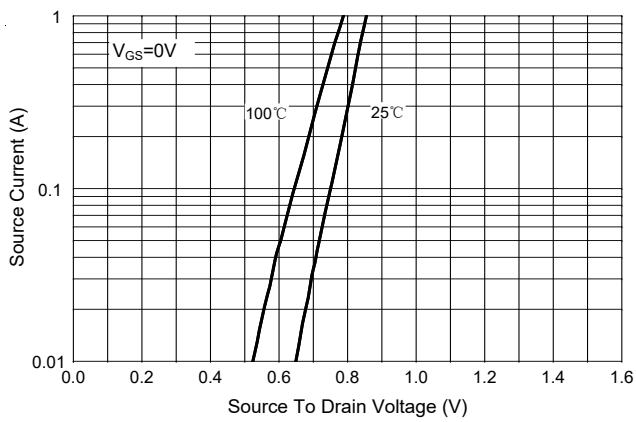


Fig.10 - Drain Current

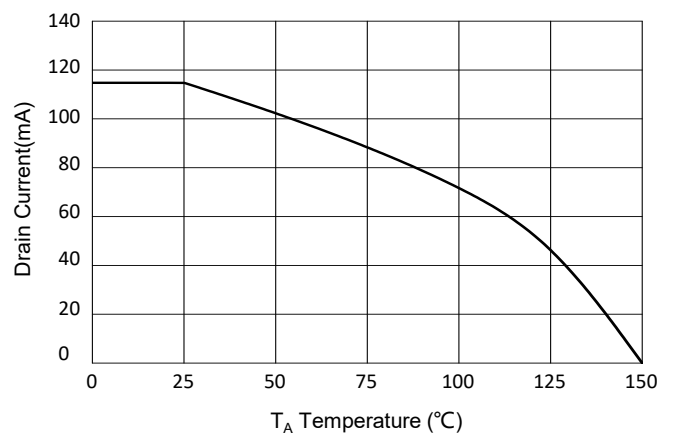
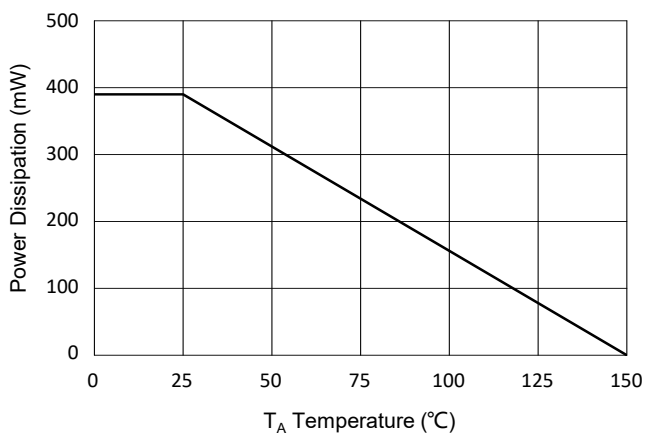


Fig.11 - PD Dissipation



Curve Characteristics(N-Channel)

Fig.12 - Safe Operation Area

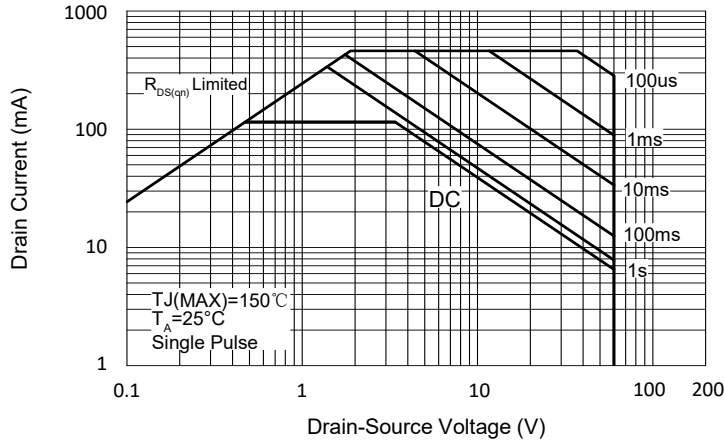
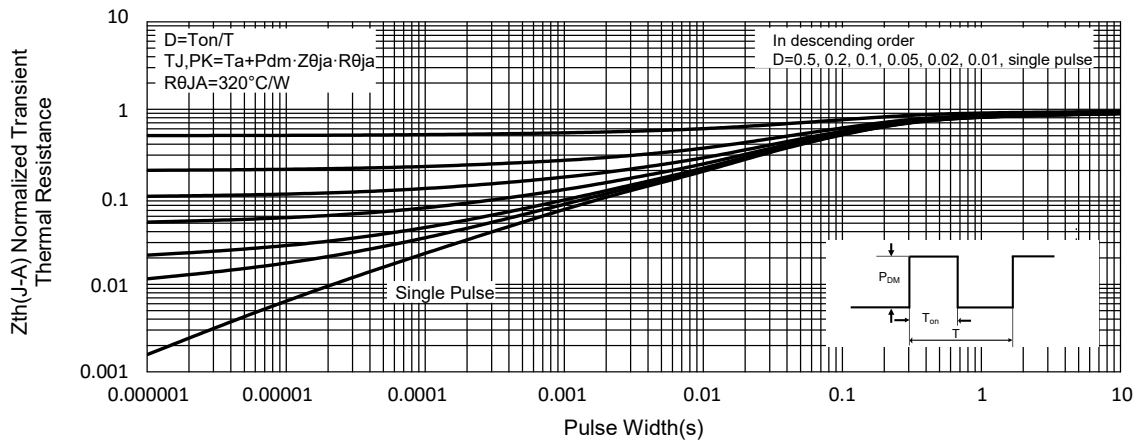


Fig.13 - Normalized Transient Thermal Impedance



Curve Characteristics(P-Channel)

Fig. 1 - Typical Output Characteristics

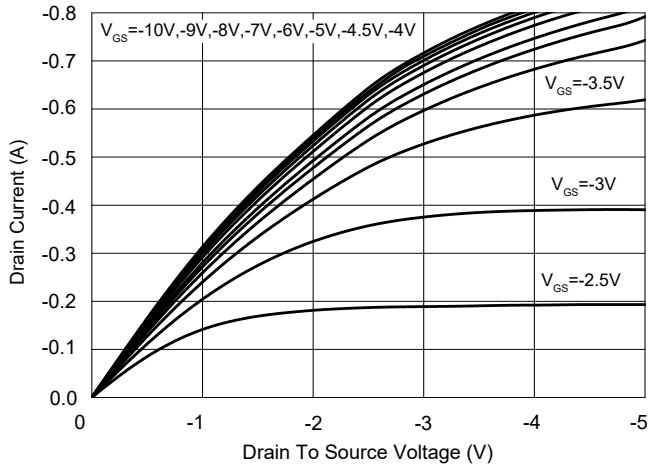


Fig. 2 - Transfer Characteristics

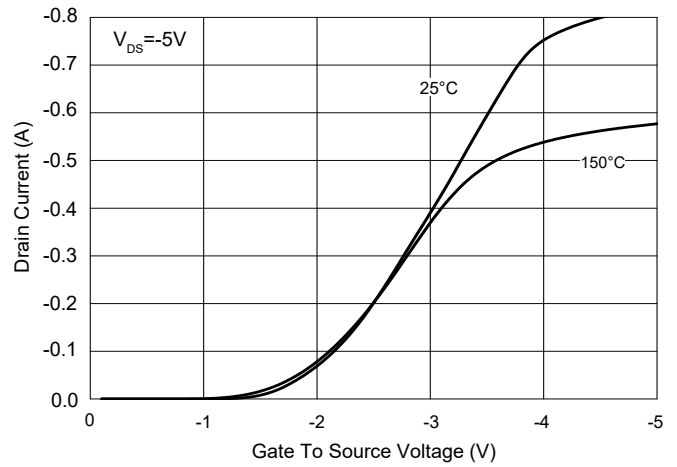


Fig.3 Rds(on)-Vgs

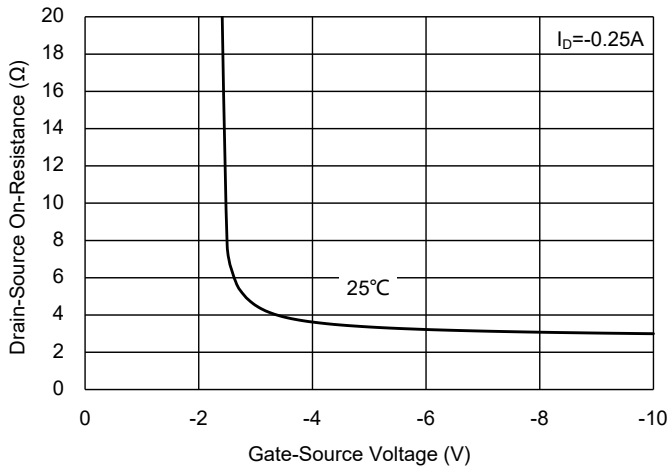


Fig.4 RDS(ON)-ID

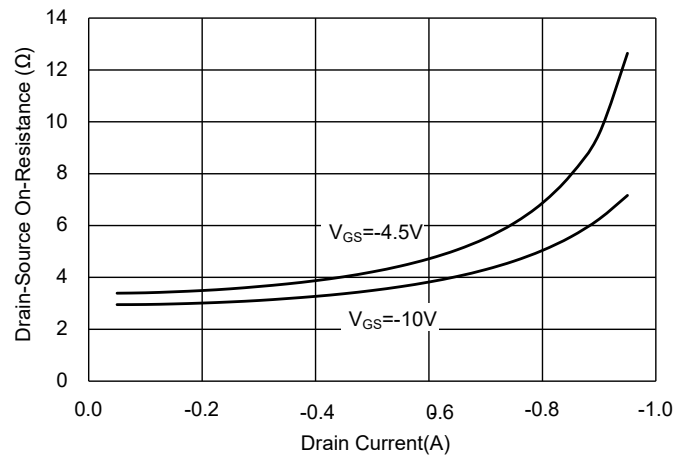


Fig. 5 - Capacitance Characteristics

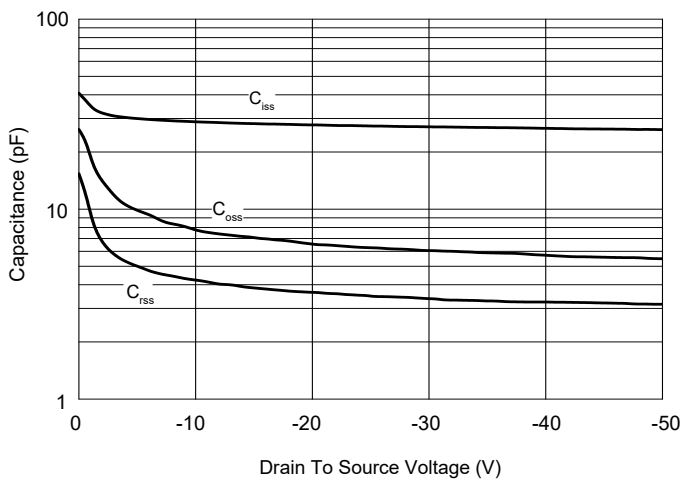
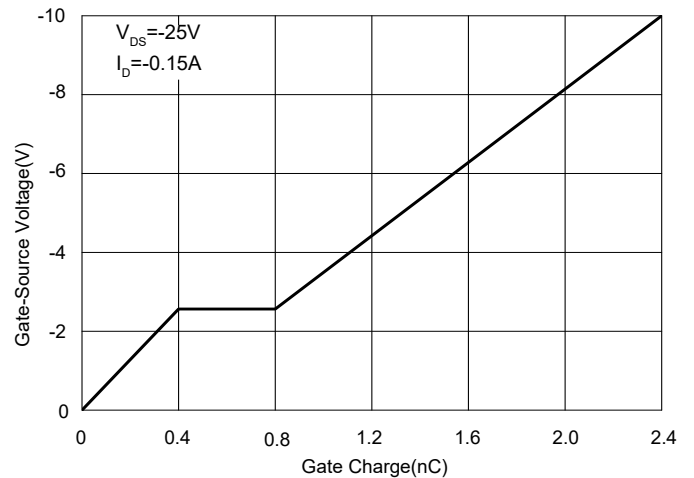


Fig.6 Gate Charge



Curve Characteristics(P-Channel)

Fig.7 - Normalized Threshold Voltage

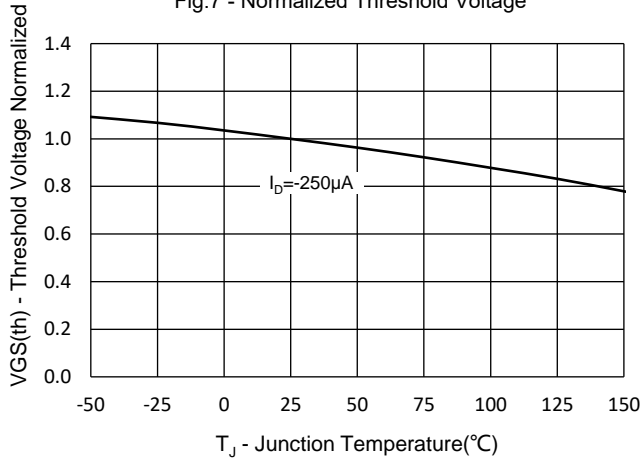


Fig.8 - Normalized On Resistance Characteristics

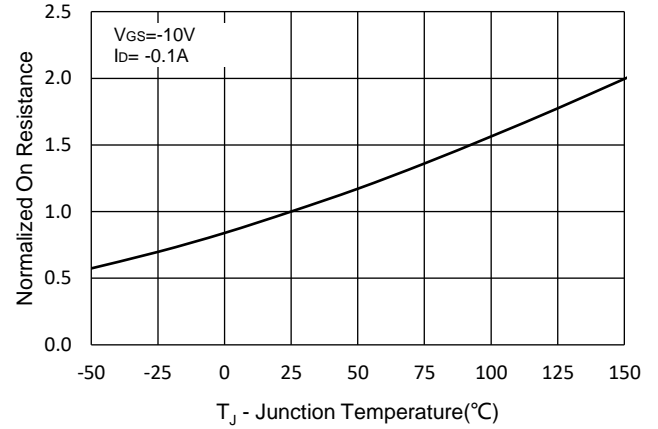


Fig.9 IS-VSD

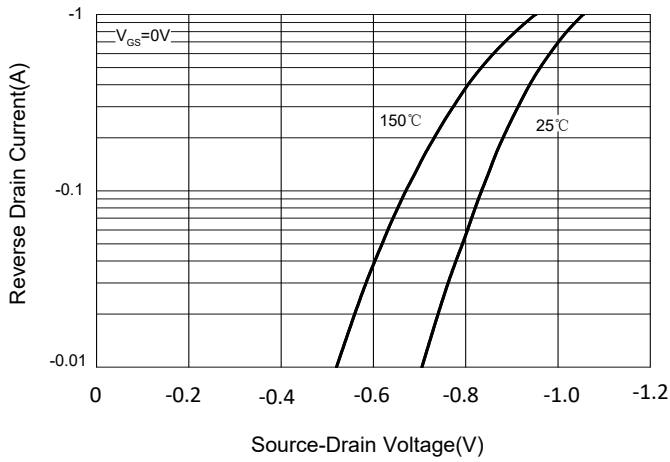


Fig. 10 - Drain Current

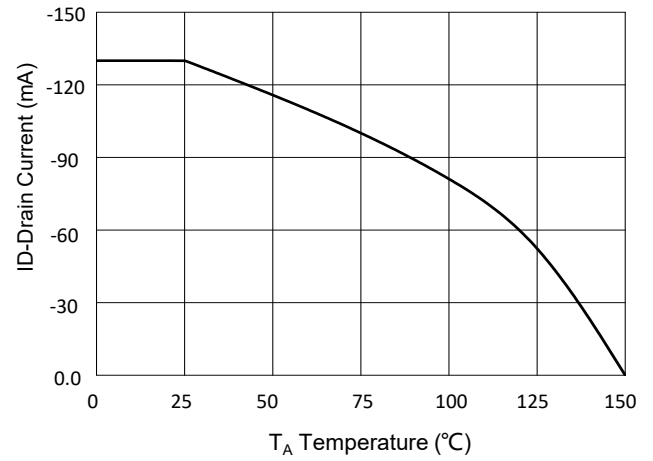
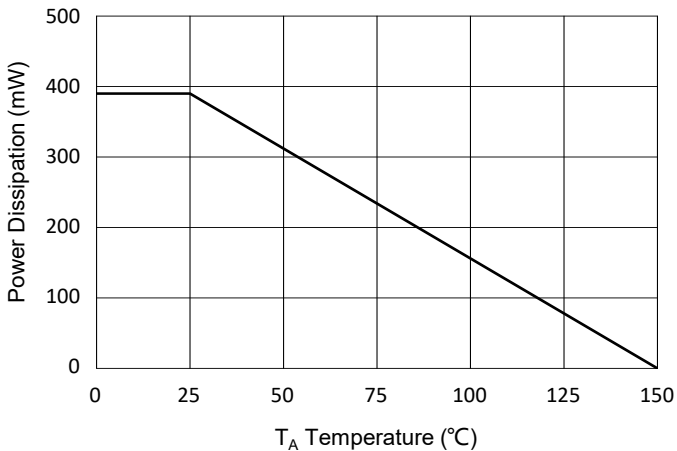


Fig.11 - PD Dissipation



Curve Characteristics(P-Channel)

Fig.12 - Safe Operation Area

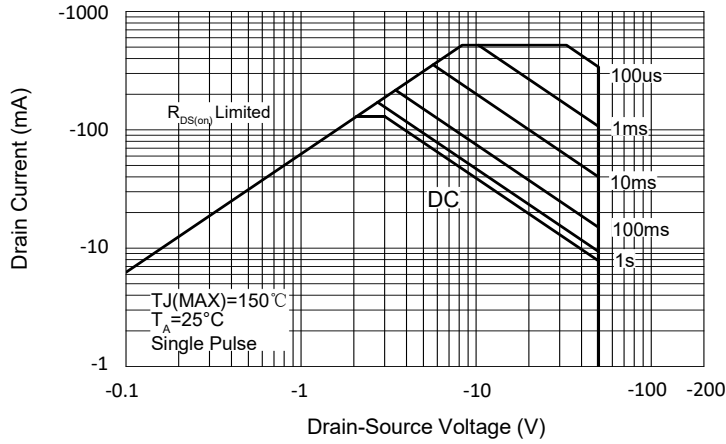
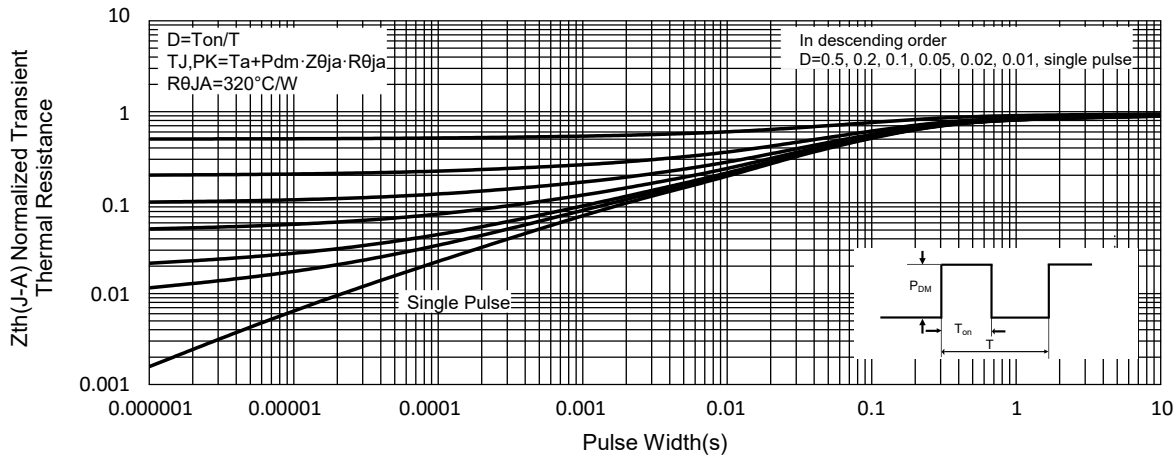


Fig.13 Normalized Transient Thermal Impedance



Ordering Information

Device	Packing
Part Number-TP	Tape&Reel: 3Kpcs/Reel

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