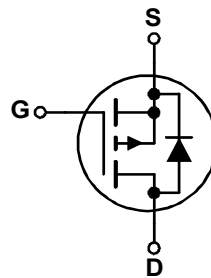
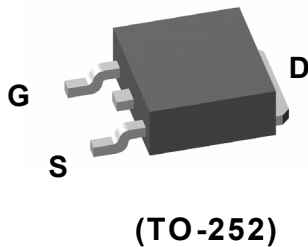


40V P-Channel PowerTrench[®] MOSFET

-40V, -45A, 14mΩ

Features

- Max $r_{DS(on)}$ = 14mΩ at $V_{GS} = -10V$, $I_D = -45A$
- Max $r_{DS(on)}$ = 20mΩ at $V_{GS} = -4.5V$, $I_D = -30A$



Drain-Source Voltage	V_{DS}	-4	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current-Continuous	I_D	-45	A
Drain Current-Continuous($T_C=100^\circ\text{C}$)	$I_D(100^\circ\text{C})$	-25	A
Pulsed Drain Current	I_{DM}	-50	A
Maximum Power Dissipation	P_D	80	W
Derating factor		0.53	W/°C
Single pulse avalanche energy ^(Note 5)	E_{AS}	544	mJ
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 To 175	°C

Notes

- a. Package limited.
- b. Pulse test; pulse width $\leq 300 \mu\text{s}$, duty cycle $\leq 2\%$.
- c. When mounted on 1" square PCB (FR4 material).
- d. Parametric verification ongoing.

Thermal Characteristic

Thermal Resistance, Junction-to-Case ^(Note 2)	$R_{\theta JC}$	1.88	$^{\circ}\text{C}/\text{W}$
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Electrical Characteristics ($T_C=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=-250\mu\text{A}$	-40	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=-40V, V_{GS}=0V$	-	-	-1	μA
Gate-Body Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 100	nA
On Characteristics ^(Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu\text{A}$	-1.5	-1.9	-3.0	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=-10V, I_D=-45A$	-	15	-	m Ω
Forward Transconductance	g_{FS}	$V_{DS}=-5V, I_D=-20A$	34	-	-	S
Dynamic Characteristics ^(Note 4)						
Input Capacitance	C_{ISS}	$V_{DS}=-20V, V_{GS}=0V,$ $F=1.0\text{MHz}$	-	2960	-	PF
Output Capacitance	C_{OSS}		-	370	-	PF
Reverse Transfer Capacitance	C_{RSS}		-	310	-	PF
Switching Characteristics ^(Note 4)						
Turn-on Delay Time	$t_{d(on)}$	$V_{DD}=-20V, I_D=-20A$ $V_{GS}=-10V, R_G=3\Omega$	-	10	-	nS
Turn-on Rise Time	t_r		-	18	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	38	-	nS
Turn-Off Fall Time	t_f		-	24	-	nS
Total Gate Charge	Q_g	$V_{DS}=-20, I_D=-20A,$ $V_{GS}=-10V$	-	72	-	nC
Gate-Source Charge	Q_{gs}		-	14	-	nC
Gate-Drain Charge	Q_{gd}		-	15	-	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage ^(Note 3)	V_{SD}	$V_{GS}=0V, I_S=-20A$	-	-	-1.2	V
Diode Forward Current ^(Note 2)	I_S		-	-	-40	A
Reverse Recovery Time	t_{rr}	$T_J = 25^{\circ}\text{C}, I_F = -20A$ $di/dt = -100A/\mu\text{s}$ ^(Note 3)	-	40	-	nS
Reverse Recovery Charge	Q_{rr}		-	42	-	nC
Forward Turn-On Time	t_{on}	Intrinsic turn-on time is negligible (turn-on is dominated by LS+LD)				

Typical Electrical and Thermal Characteristics (Curves)

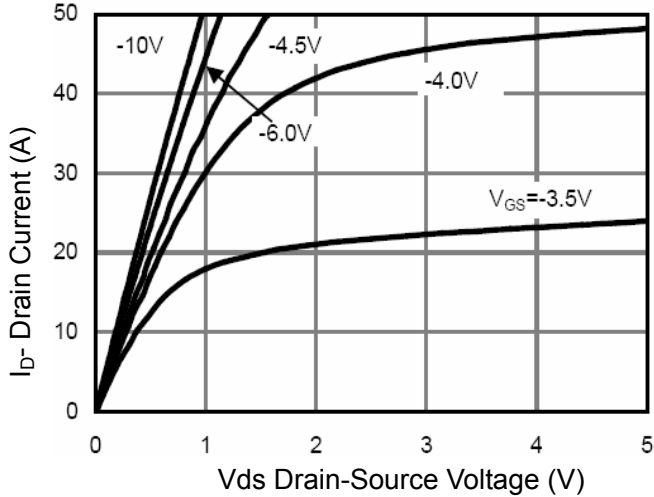


Figure 1 Output Characteristics

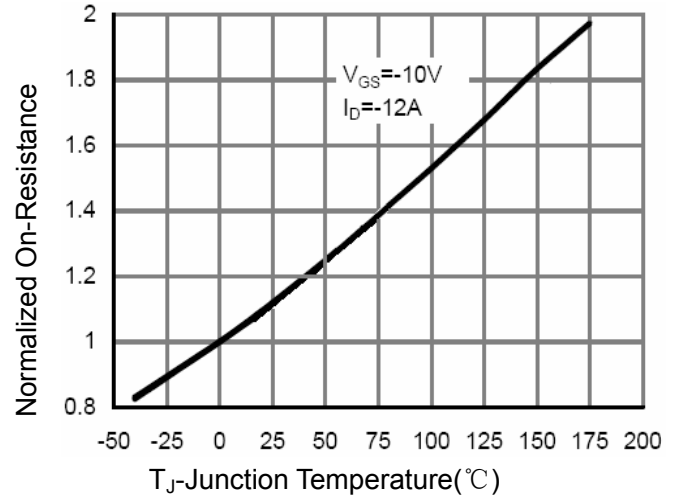


Figure 4 Rdson-Junction Temperature

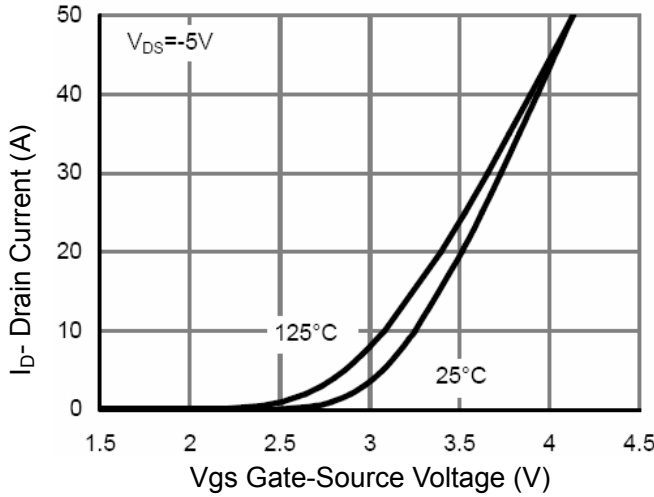


Figure 2 Transfer Characteristics

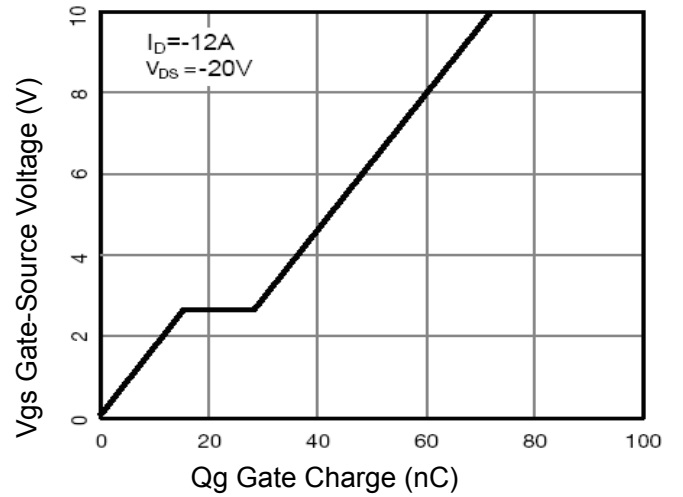


Figure 5 Gate Charge

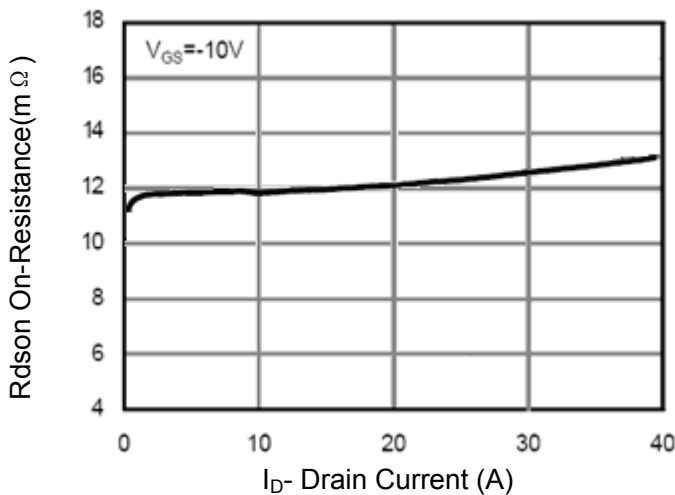


Figure 3 Rdson- Drain Current

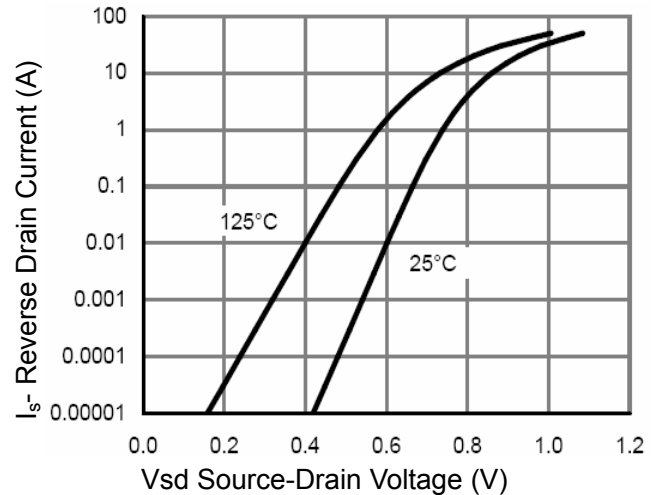


Figure 6 Source- Drain Diode Forward

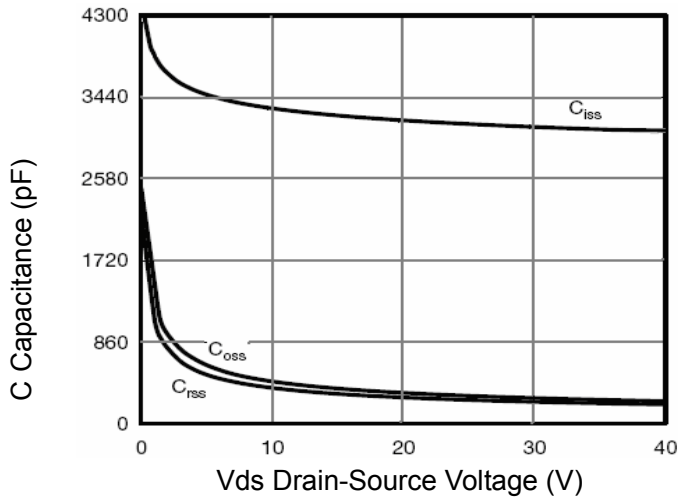


Figure 7 Capacitance vs Vds

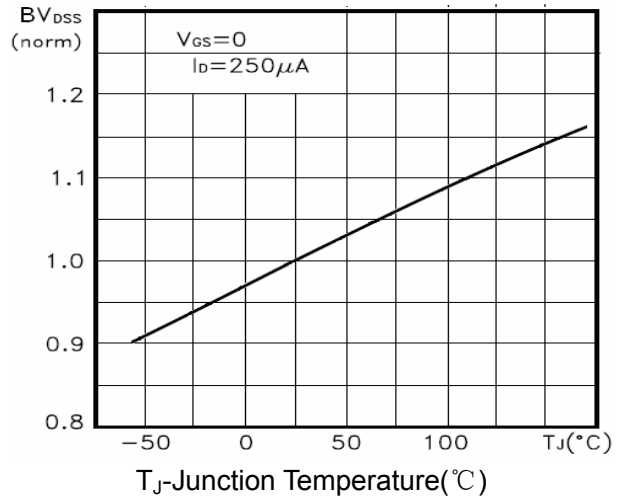


Figure 9 BV_{DSS} vs Junction Temperature

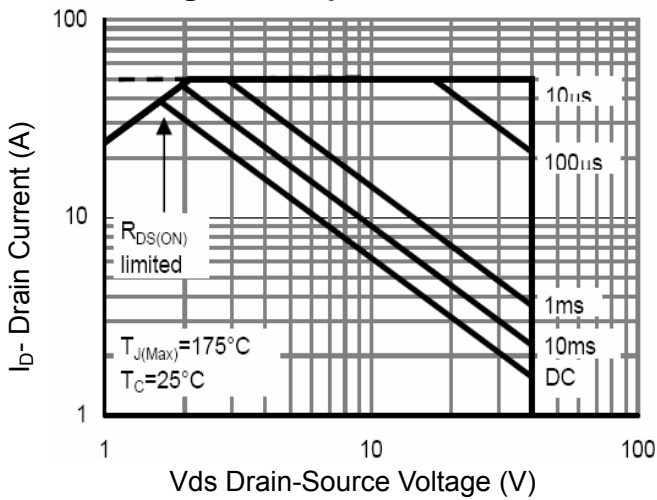


Figure 8 Safe Operation Area

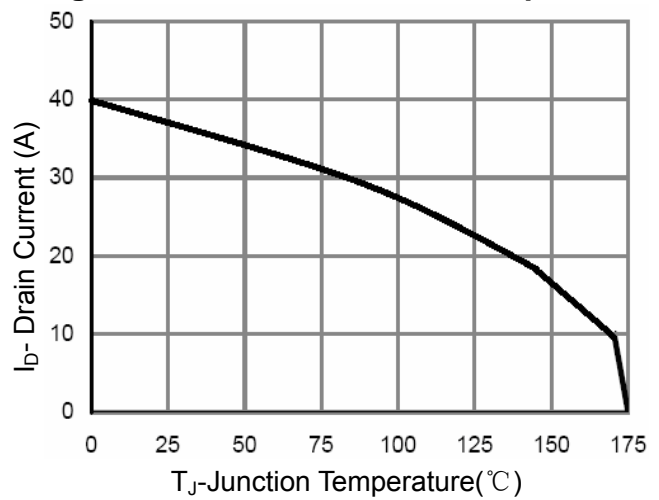


Figure 10 I_D Current Derating vs Junction Temperature

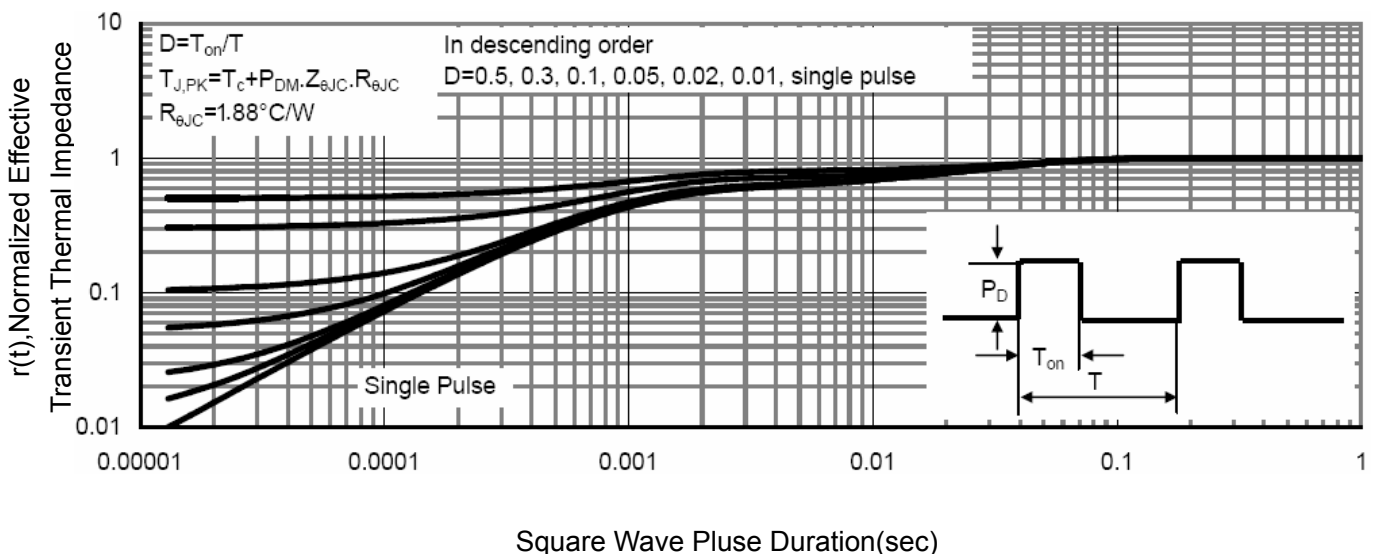


Figure 11 Normalized Maximum Transient Thermal Impedance