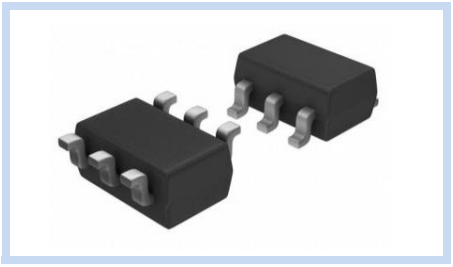
N/P Channel MOSFET
20V 1A/0.7A 0.36W SOT-363 ESD

MFT2NP1A0S363E

MERITEK

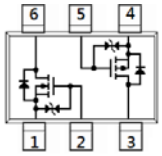
FEATURE

- $R_{DS(ON)}$<150mΩ, V_{GS}=4.5V, I_D=1A
- $R_{DS(ON)}$<215mΩ, V_{GS}=2.5V, I_D=0.7A
- $R_{DS(ON)}$<400mΩ, V_{GS}=1.8V, I_D=0.3A
- ESD Protected 2KV HBM



MECHANICAL DATA

- Case: SOT-363, Molded Plastic
- Terminals: Solderable per MIL-STD-750, Method 2026



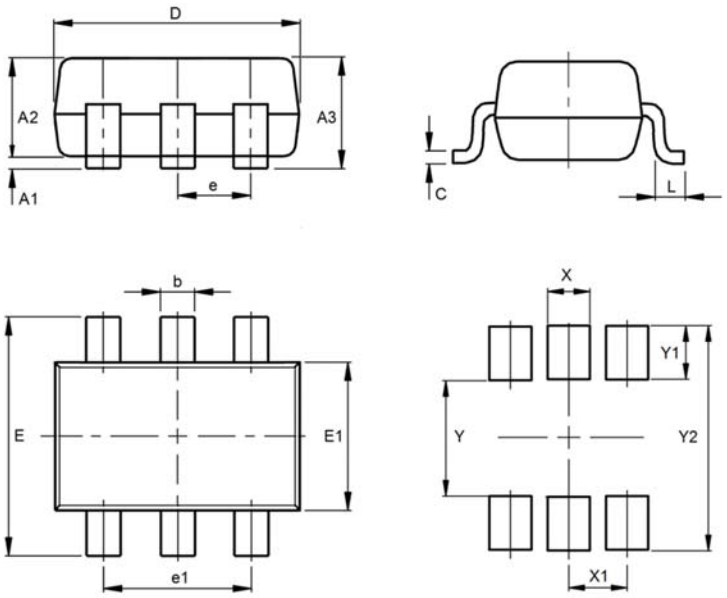
RoHS

MAXIMUM RATINGS

Parameter		Symbol	Value		Unit
Drain-Source Voltage		V_{DS}	20	-20	V
Gate-Source Voltage		V_{GS}	±8	±8	V
Drain Current – Continuous		I_D	1	-0.7	A
Drain Current – Pulsed		I_{DM}	4	-2.8	A
Power Dissipation	T_A= 25°C	P_D	360		mW
	Derate above 25°C		2.8		mW/°C
Thermal Resistance Junction to Ambient		$R_{\theta JA}$	357		°C/W
Operating Junction and Storage Temperature		T_J, T_{STG}	-55 to 150		°C

DIMENSIONS

Item	Min (mm)	Max (mm)
A1	0.00	0.10
A2	0.80	1.00
A3	-	1.10
b	0.15	0.30
C	0.08	0.25
D	1.90	2.20
e	0.55	0.75
e1	1.20	1.40
E	2.00	2.20
E1	1.15	1.35
L	0.15	0.45
Y	1.18	
Y1	0.66	
Y2	2.50	
X	0.45	
X1	0.65	

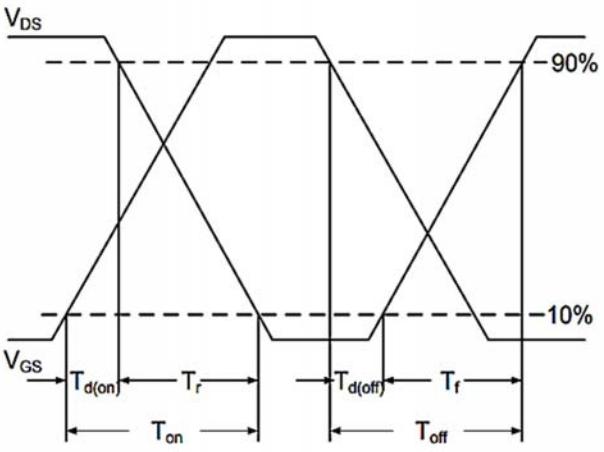


ELECTRICAL CHARACTERISTICS - N-CH

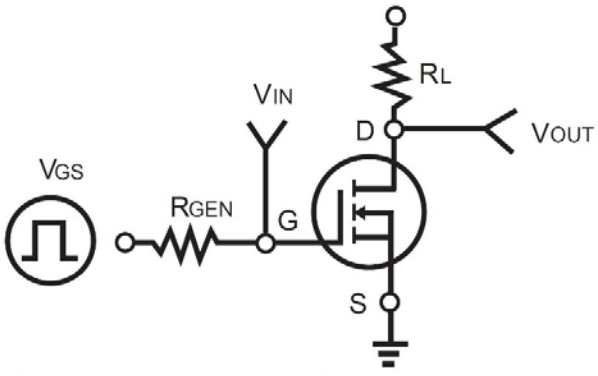
Off Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250uA	BV_{DSS}	20	--	--	V
Drain-Source Leakage Current	V_{DS}=20V, V_{GS}=0V,	I_{DSS}	--	0.01	1	uA
Gate-Source Leakage Current	V_{GS}=±8V, V_{DS}=0V	I_{GSS}	--	±2	±10	uA
On Characteristics	**Conditions**	**Symbol**	**Min**	**Typ.**	**Max**	**Unit**
Static Drain-Source On-Resistance	V_{GS}=4.5V, I_D=1A	$R_{DS(ON)}$	--	114	150	mΩ
	V_{GS}=2.5V, I_D=0.7A		--	160	215	
	V_{GS}=1.8, I_D=0.3A		--	280	400	
Gate Threshold Voltage	V_{GS}=V_{DS}, I_D=250uA	$V_{GS\ (th)}$	0.5	0.8	1.0	V
Dynamic Characteristics	**Conditions**	**Symbol**	**Min**	**Typ.**	**Max**	**Unit**
Total Gate Charge	V_{DS}=10V, I_D=1A V_{GS}=4.5V	Q_g	--	1.6	--	nC
Gate-Source Charge		Q_{gs}	--	0.3	--	
Gate-Drain Charge		Q_{gd}	--	0.41	--	
Turn-On Delay Time	V_{DD}=10V, I_D=1A V_{GS}=4.5V, R_G=6Ω	$T_{d(on)}$	--	5.8	--	ns
Rise Time		T_r	--	25.7	--	
Turn-Off Delay Time		$T_{d(off)}$	--	41	--	
Fall Time		T_f	--	2831	--	
Input Capacitance	V_{DS}=10V, V_{GS}=0V, F=1MHz	C_{iss}	--	92	--	pF
Output Capacitance		C_{oss}	--	25	--	
Reverse Transfer Capacitance		C_{rss}	--	9.7	--	
Drain-Source Body Diode	**Conditions**	**Symbol**	**Min**	**Typ.**	**Max**	**Unit**
Continuous Source Current	--	I_S	--	--	1	A
Diode Forward Voltage	V_{GS}=0V, I_S=1A	V_{SD}	--	0.8	1.2	V

Note:
1. Repetitive Rating: Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed, pulse width ≤ 300us, duty cycle ≤2%.
3. Essentially independent of operating temperature.
4. T_J=25°C, unless otherwise noted.

Switching Time Waveform



Switching Test Circuit

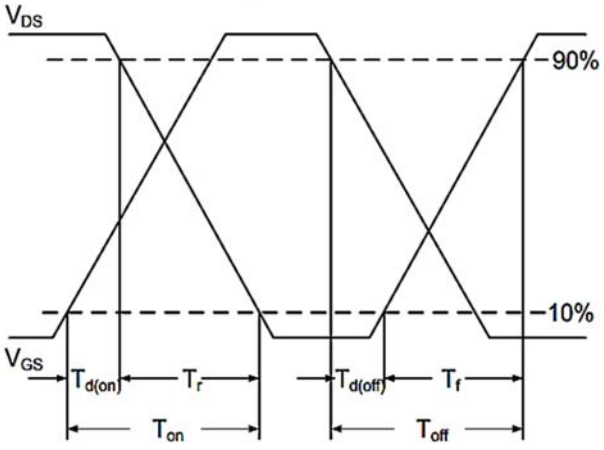


ELECTRICAL CHARACTERISTICS - P-CH

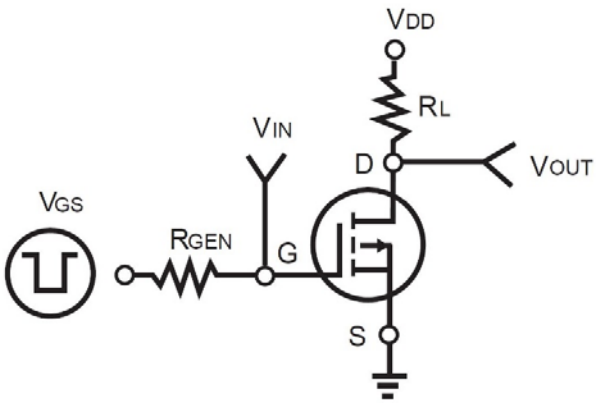
Off Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=-250uA	BV_{DSS}	-20	--	--	V
Drain-Source Leakage Current	V_{DS}=-20V, V_{GS}=0V	I_{DSS}	--	-0.01	-1	uA
Gate-Source Leakage Current	V_{GS}=±8V, V_{DS}=0V	I_{GSS}	--	±3.5	±10	uA
On Characteristics	**Conditions**	**Symbol**	**Min**	**Typ.**	**Max**	**Unit**
Static Drain-Source On-Resistance	V_{GS}=-4.5V, I_D=-0.7A	$R_{DS(ON)}$	--	260	325	mΩ
	V_{GS}=-2.5V, I_D=-0.6A		--	310	420	
	V_{GS}=-1.8V, I_D=-0.5A		--	400	600	
Gate Threshold Voltage	V_{GS}=V_{DS}, I_D=-250uA	$V_{GS\ (th)}$	-0.5	-0.64	-1	V
Dynamic Characteristics	**Conditions**	**Symbol**	**Min**	**Typ.**	**Max**	**Unit**
Total Gate Charge	V_{DS}=-10V, I_D=-0.7A V_{GS}=-4.5V	Q_g	--	2.2	--	nC
Gate-Source Charge		Q_{gs}	--	0.4	--	
Gate-Drain Charge		Q_{gd}	--	0.5	--	
Turn-On Delay Time	V_{DD}=-10V, I_D=-0.7A V_{GS}=-4.5V, RG=6Ω	$T_{d(on)}$	--	2.2	--	ns
Rise Time		T_r	--	19.2	--	
Turn-Off Delay Time		$T_{d(off)}$	--	6.2	--	
Fall Time		T_f	--	23	--	
Input Capacitance	V_{DS}=-10V, V_{GS}=0V, F=1MHz	C_{iss}	--	151	--	pF
Output Capacitance		C_{oss}	--	27	--	
Reverse Transfer Capacitance		C_{rss}	--	8.8	--	
Drain-Source Body Diode	**Conditions**	**Symbol**	**Min**	**Typ.**	**Max**	**Unit**
Continuous Source Current	--	I_S	--	--	-1	A
Diode Forward Voltage	V_{GS}=0V, I_S=-1A	V_{SD}	--	-0.86	-1.2	V

Note:
1. Repetitive Rating: Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed, pulse width ≤ 300us, duty cycle ≤2%.
3. Essentially independent of operating temperature.
4. T_J=25°C, unless otherwise noted.

Switching Time Waveform

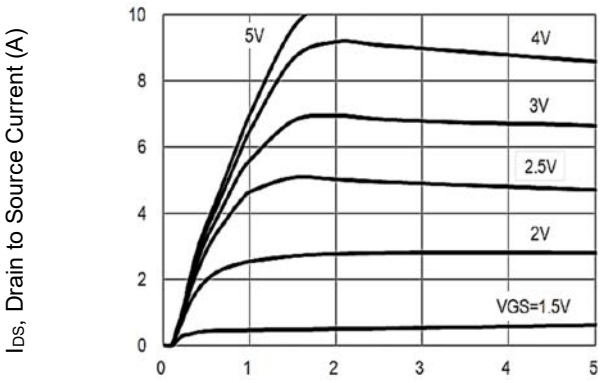


Switching Test Circuit

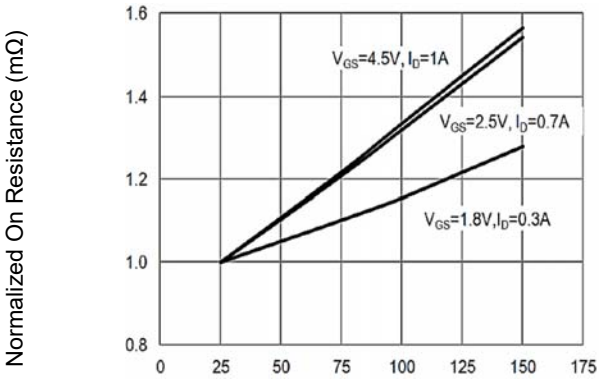


N-CH CHARACTERISTIC CURVES

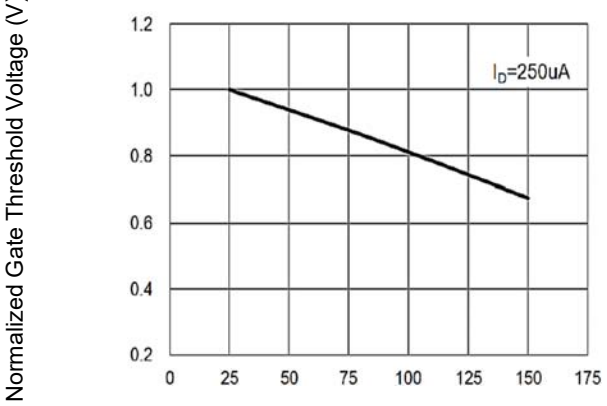
On-Region Characteristics



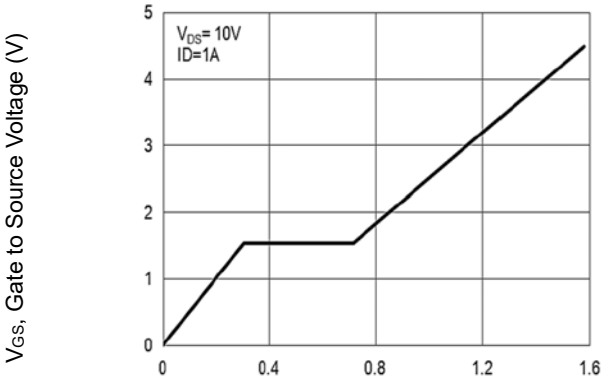
Normalized $R_{DS(ON)}$ vs. T_J



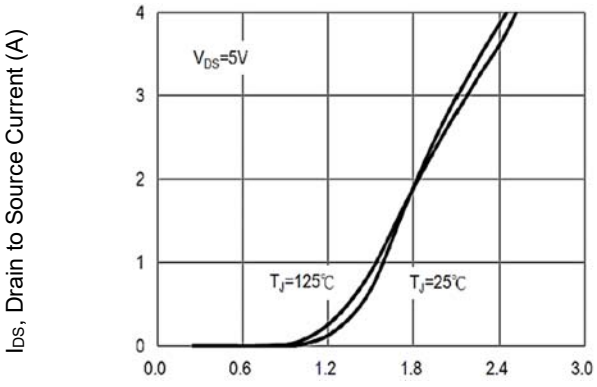
Normalized V_{th} vs. T_J



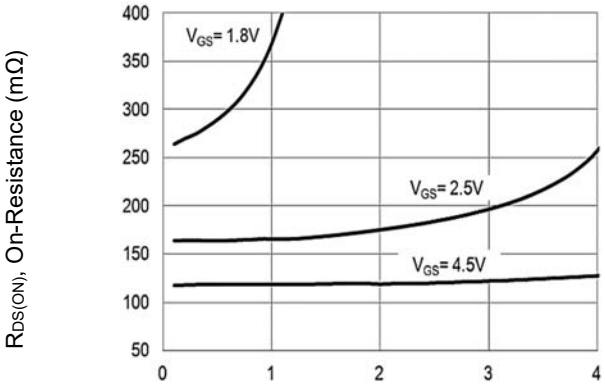
Gate Charge Waveform



Transfer Characteristics

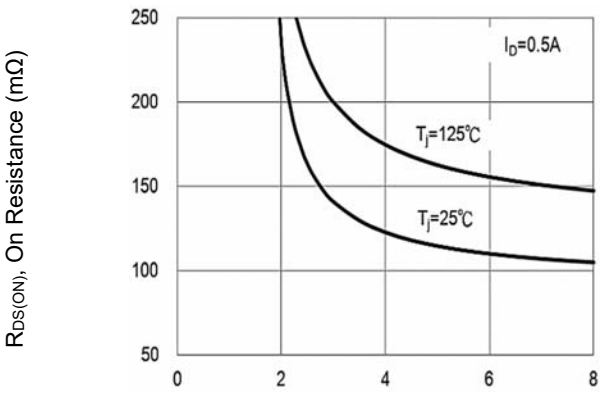


On-Resistance vs. Drain Current

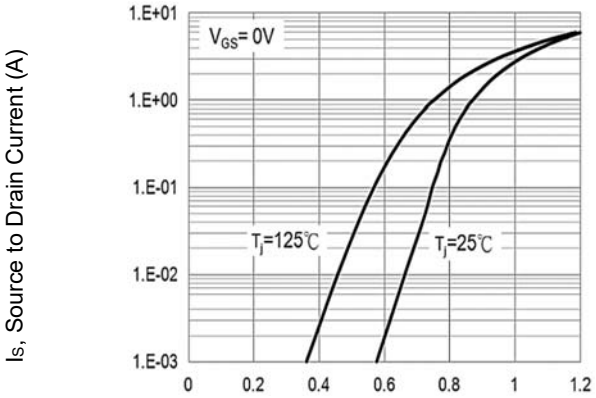


N-CH CHARACTERISTIC CURVES

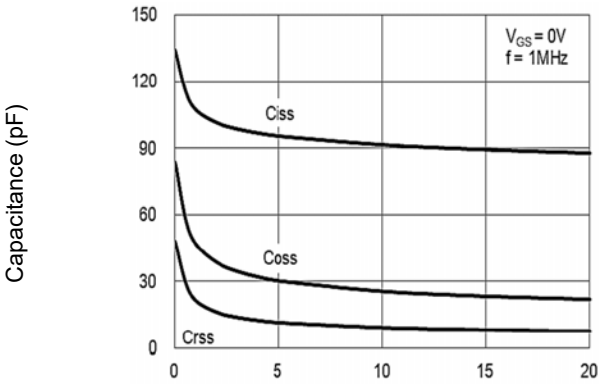
On-Resistance Variation with VGS



Body Diode

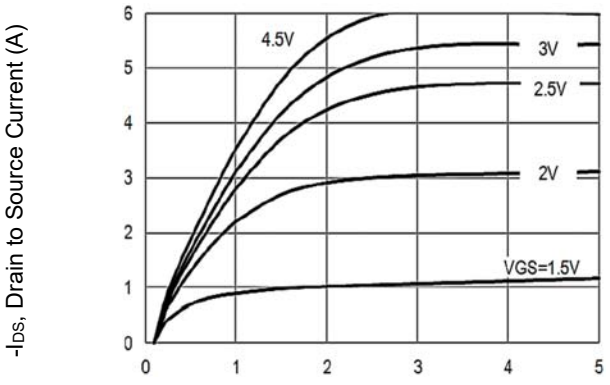


Capacitance vs. Drain-Source Voltage

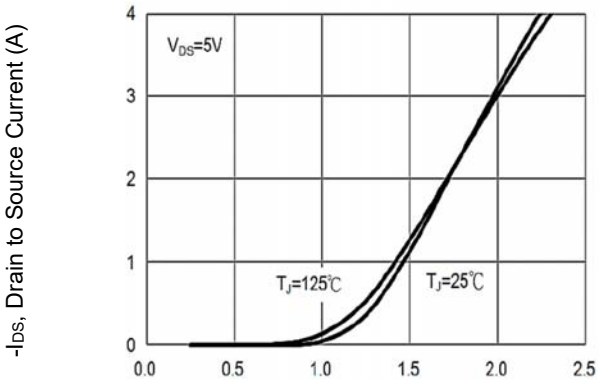


P-CH CHARACTERISTIC CURVES

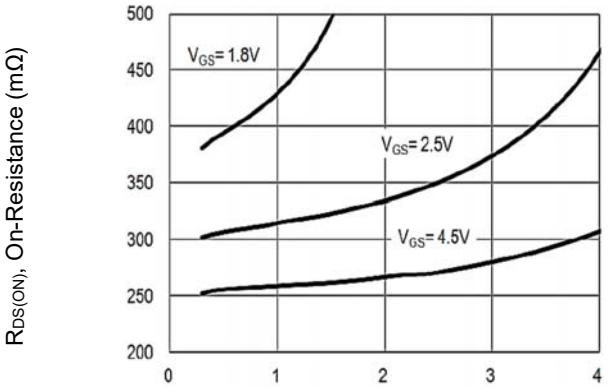
On-Region Characteristics



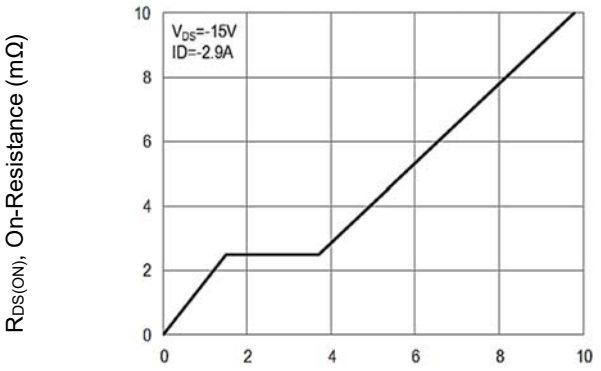
Transfer Characteristics



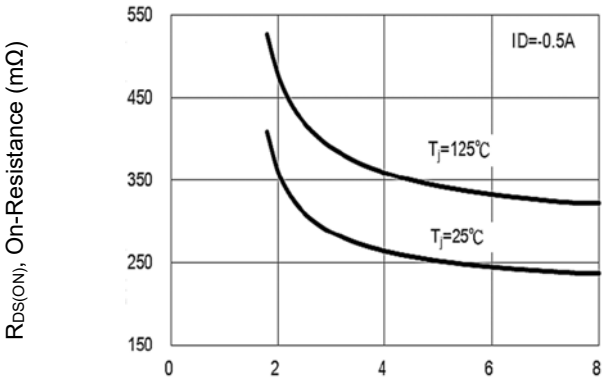
On Resistance vs Drain Current



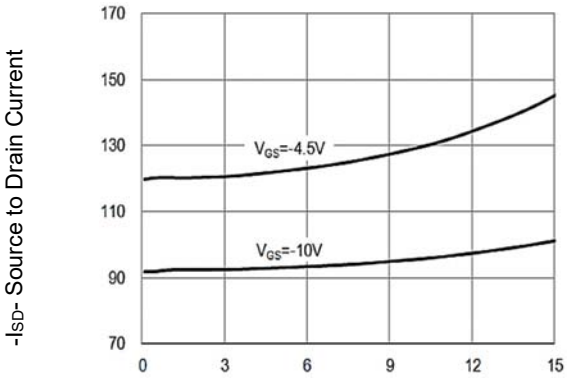
On Resistance vs Temperature



On-Resistance with V_{GS}

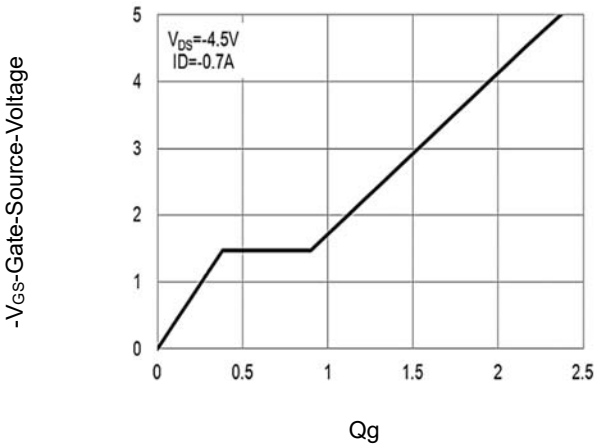


Body Diode Characteristics

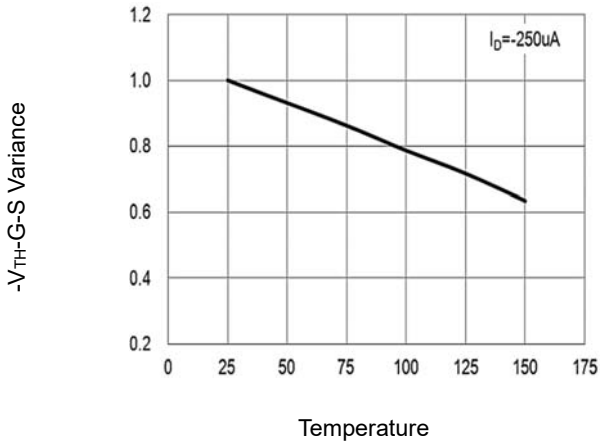


P-CH CHARACTERISTIC CURVES

Gate Charge Characteristics



Threshold Voltage Variation with Temperature



Capacitance vs. Drain-Source Voltage